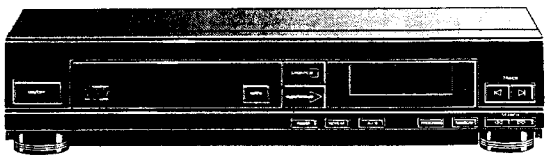
V14407

Compact disc player CD210

00R/05R

Service
Service
Service



44 722 A11

Service Manual

COMPACT disc DIGITAL AUDIO

CONTENTS

1 Contents and operation buttons
2 Technical specifications
servicing hints, loading and cabinet parts
3 Electrical measurements and adjustments
4 Blockdiagram, panel data and partslist of the main panel
5 Control and display, wiring diagram and electrical partslist

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

CLASS 1
LASER PRODUCT
3122 110 03420

Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Servicio

PHILIPS

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrees, seuls habilités à reparer votre appareil en panne".

Subject to modification
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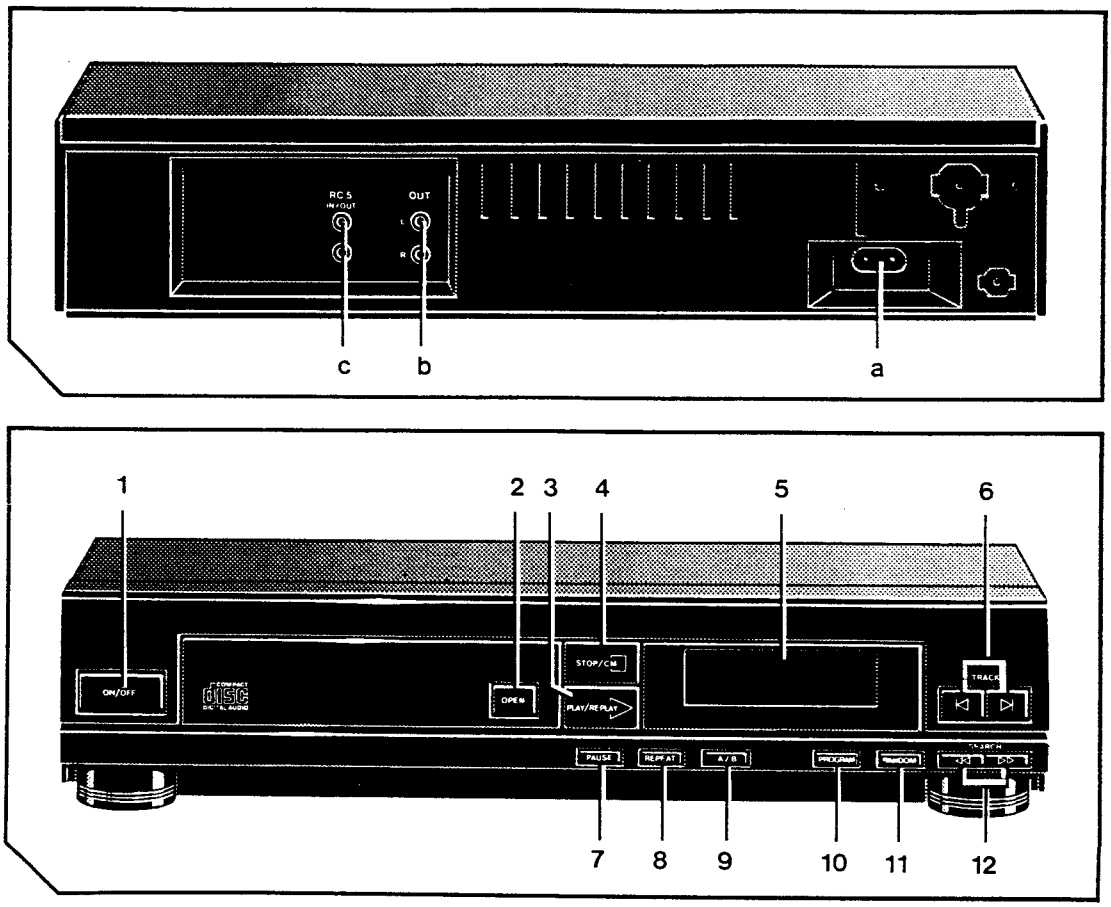
PHILIPS

Published by Service Consumer Electronics



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OPERATION

1 ON/OFF
2 OPEN
3 PLAY/REPLAY
4 STOP/CM
5 DISPLAY
6 |◁ TRACK ▷|
7 PAUSE
8 REPEAT
9 A/B
10 PROGRAM
11 RANDOM
12 ◁◁SEARCH▷▷

a CONNECTIONS FOR THE MAINSLEAD
b OUT LEFT/RIGHT
c RC5 IN/OUT

TECHNICAL DATA

Typical Audio Performance

- Number of Channels: 2
- Frequency Range: 2-20 000 Hz
- Output resistance: 1 KΩ
- Nominal load impedance: 100 kΩ//100 pF
- Amplitude Linearity: ± 1 dB max. (20-20 000 Hz)
- Phase Linearity: ± 1.0° (20-20 000 Hz)
- Dynamic Range: 65 dB min. (20-20 000 Hz)
- Signal-to-Noise Ratio: 75 dB min. (20-20 000 Hz)
- Channel Separation: 60 dB (20-20 000 Hz)
- Total Harmonic Distortion: 65 dB/0.05% (20-20 000 Hz)
- Wow and Flutter: quartz crystal precision
- D/A Conversion: quadruple oversampling (176.4 kHz) with digital filter and two 16 bit D/A converters
- Error Correction System: Cross Interleaved Reed Solomon Code (CIRC)
- Audio Output Level: 2 $V_{rms.}$

Power Supply

- Mains Voltage: see type plate at rear of player
- Mains Frequencies: 50 and 60 Hz
- Power Consumption: 15 W approx.
- Safety Requirements: IEC

Cabinet, general

- Dimensions (wxhxd)
  cabinet with tray closed: 360 x 80/86 x 300 mm approx.
  cabinet with tray opened: 360 x 80/86 x 445 mm approx.

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévite pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

SERVICING HINTS

In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

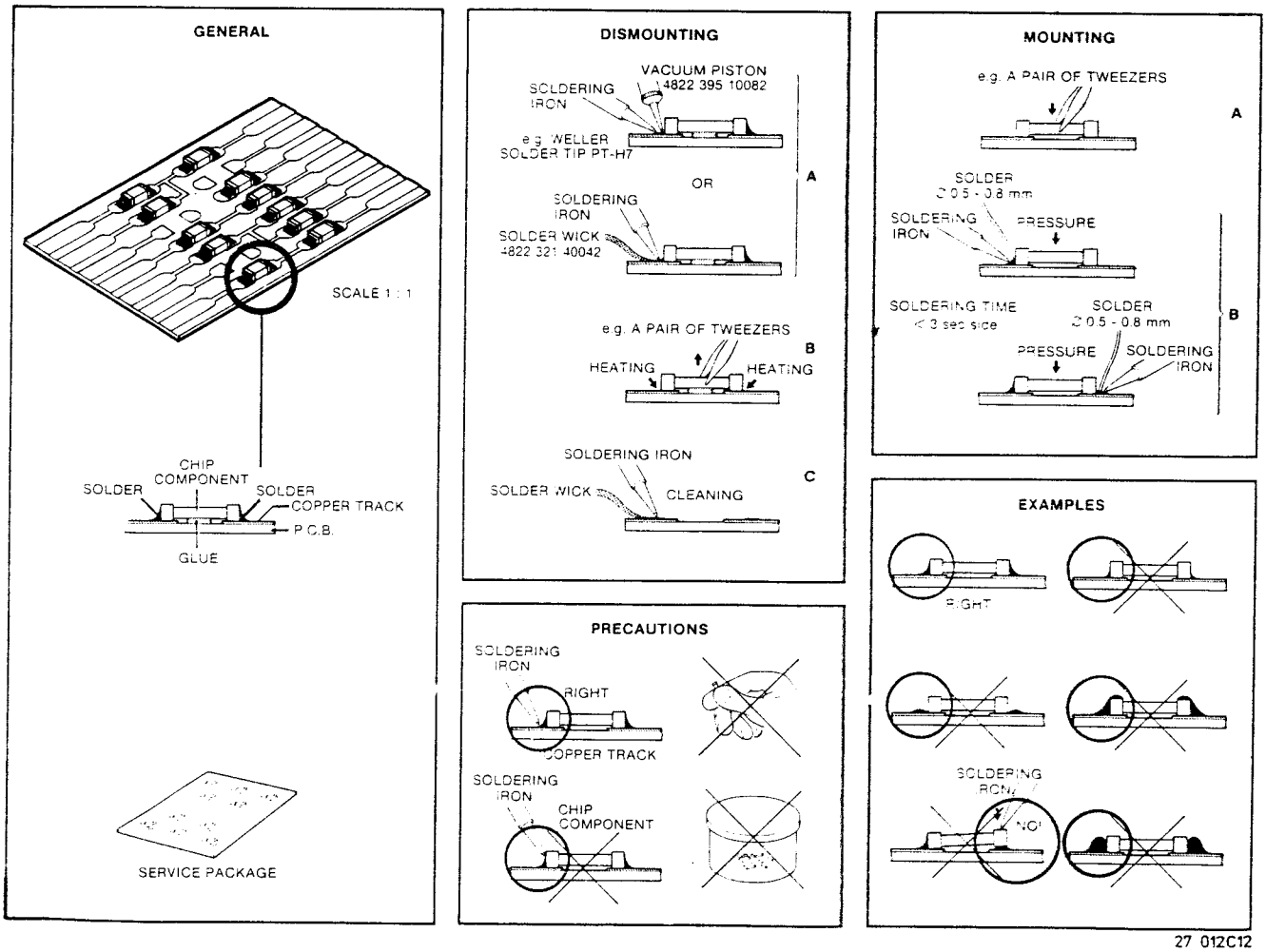
The disc should always rest properly on the turntable.
To achieve this a disc hold–down has been mounted in a bracket of the tray mechanism.
If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used. For a service disc hold–down see drawing 42565 A12.
Page 2-3

Test discs

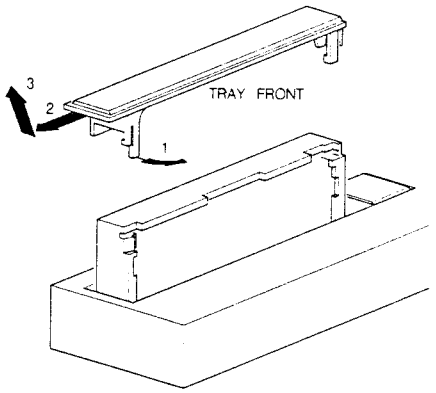
It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

SERVICE TOOLS

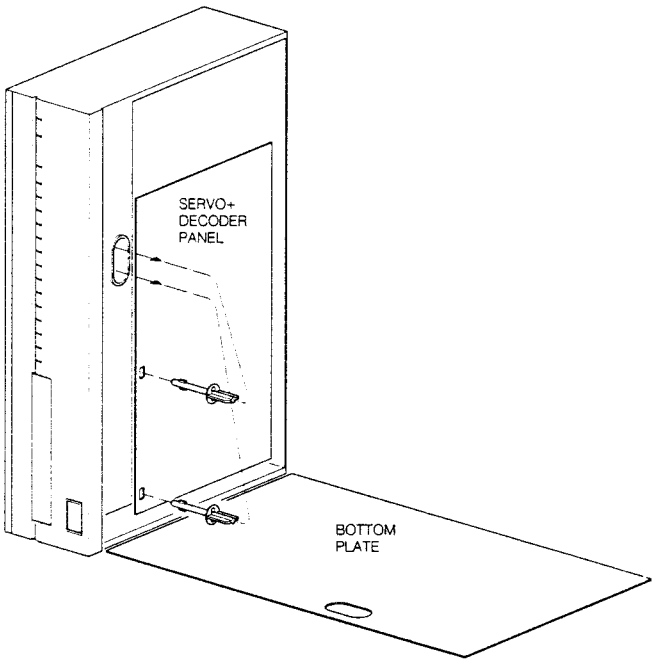
Audio signal disc (1)	4822 397 30185
Disc without errors (5)+ disc with DO errors, black spots and fingerprints (5A)	4822 397 30096
Disc 65 min 1kHz without pause	4822 397 30155
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (5p)	4822 321 21273
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Glass disc	4822 395 90204



27 012C12

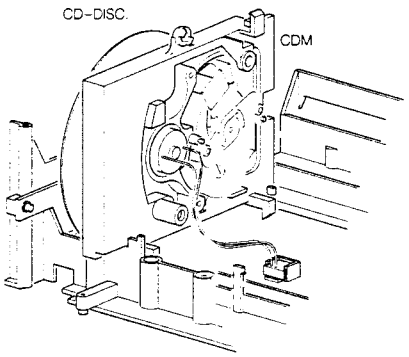


MEASURING AND ADJUSTMENT POSITION OF THE SET



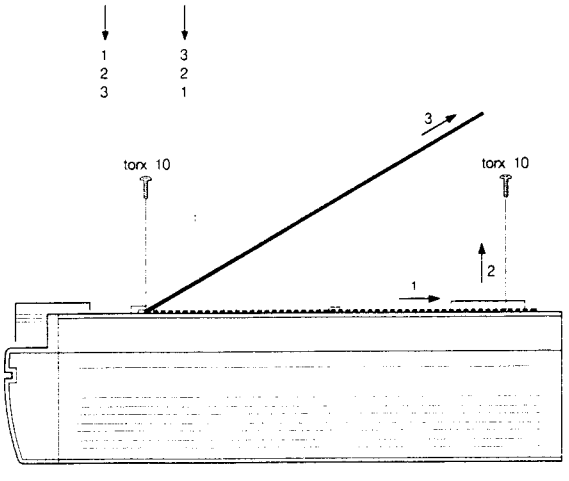
MDA 02138
916/T19

SERVICE POSITION PLAY



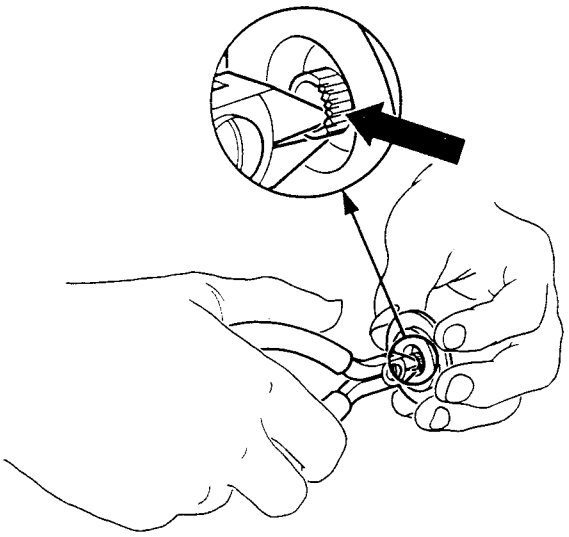
EVA 00849
916/T19

(DE)–MOUNTING THE BOTTOM PLATE



MDA 02161
120-918

SERVICE DISC-HOLDDOWN

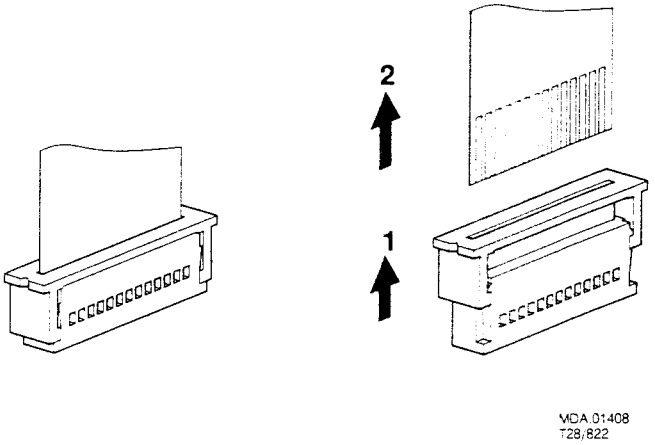


42 565 A12

Compose a service Disc hold-down in the following way

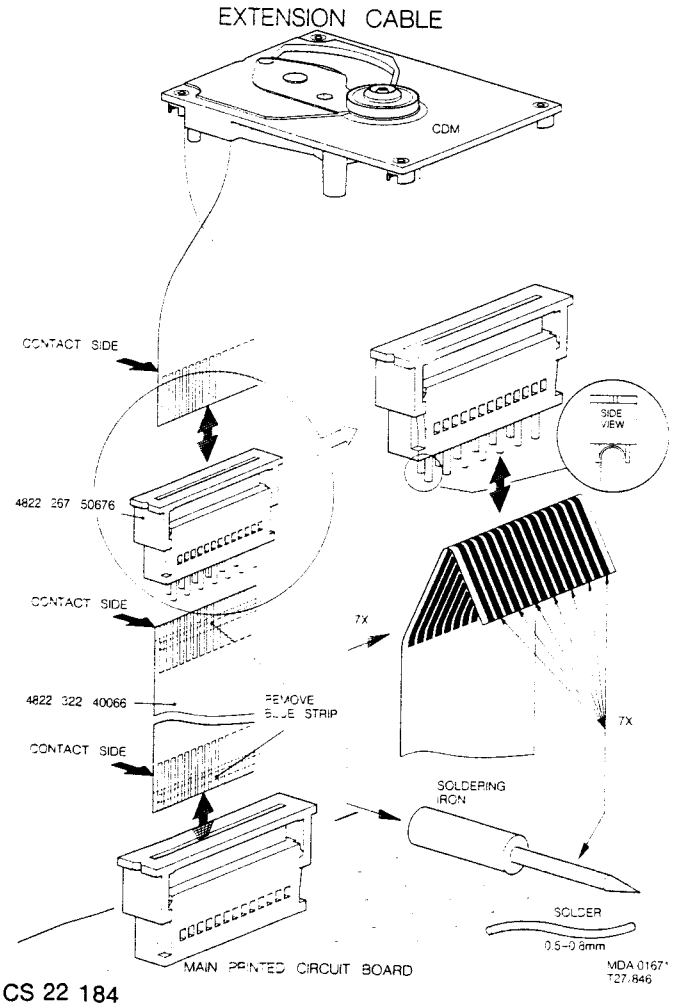
- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

DEMOUNTING FOIL CDM



MDA 01408
T28/822

SERVICE CDM FOIL

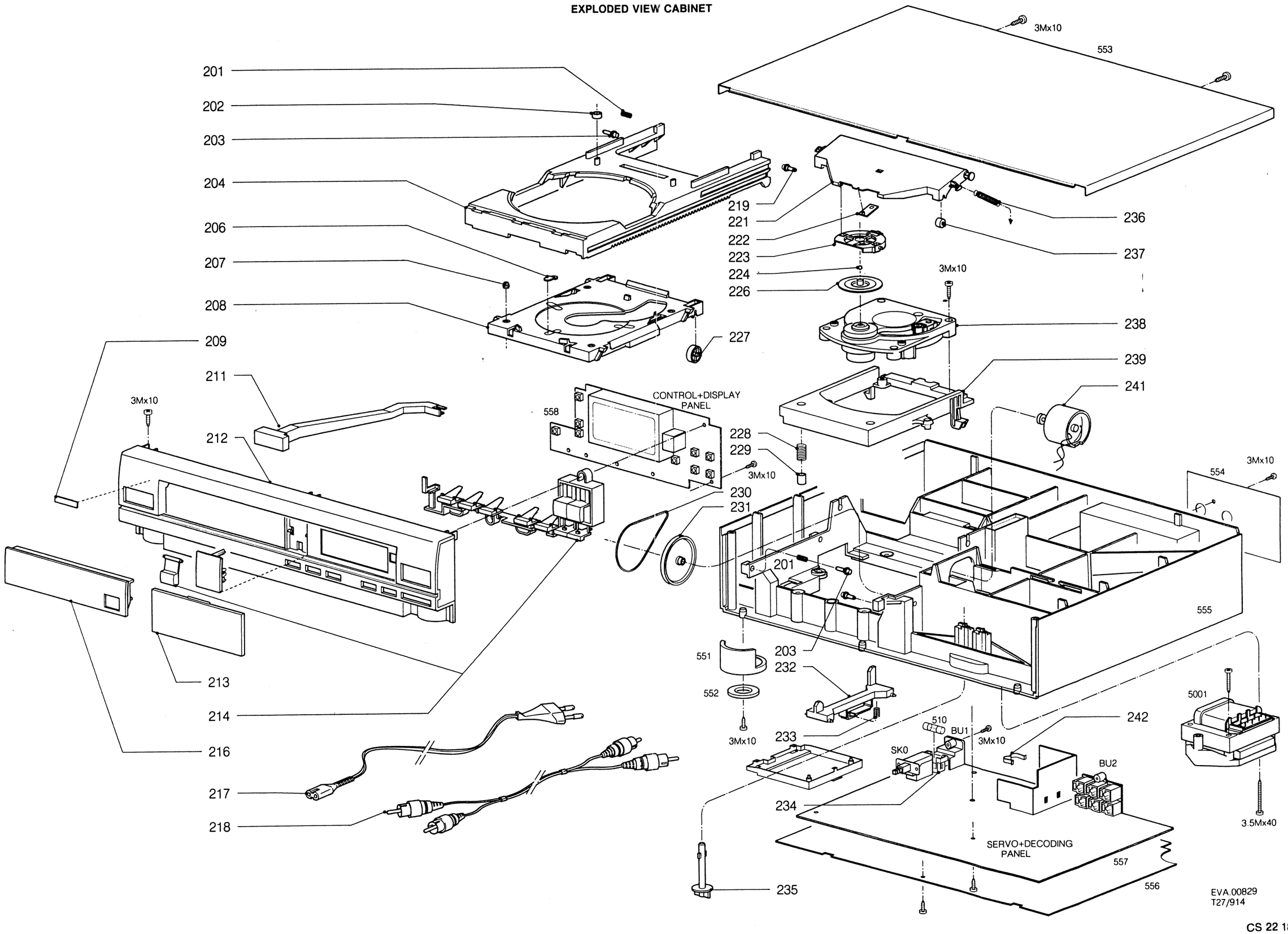


MDA 0167
T27/846

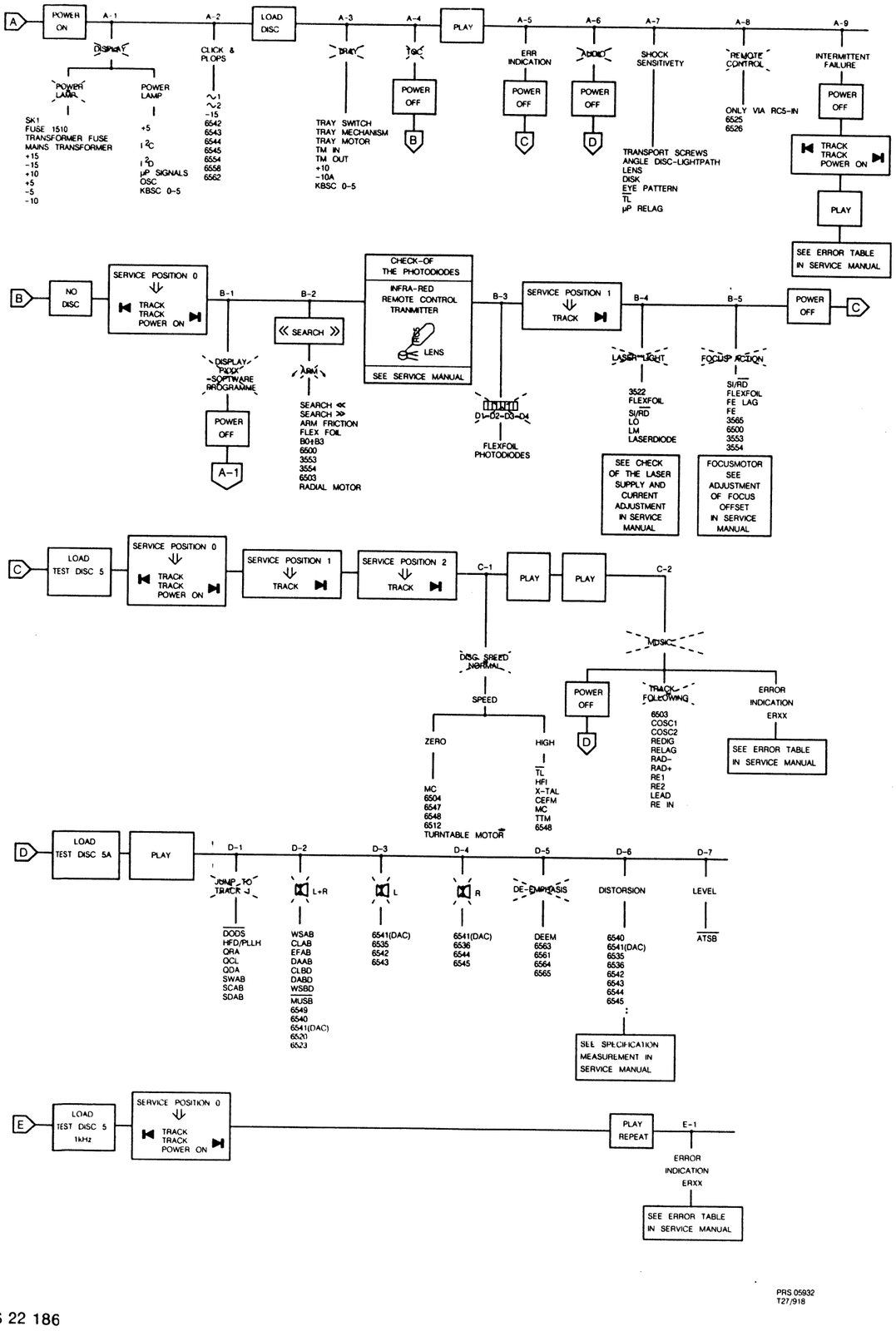
CABINET PARTS

201	4822 492 52094	
202	4822 532 51756	
203	4822 402 61252	
204	4822 444 50603	
206	4822 325 50176	
207	4822 325 50177	
208	4822 466 92251	(+ pos. 206, 207, 227)
209	4822 459 10806	
211	4822 410 60107	
212	4822 444 40306	
213	4822 381 11053	
214	4822 410 60106	
216	4822 444 40307	
217	4822 321 10457	
218	4822 321 22873	
219	4822 402 61253	
221	4822 444 60568	
222	4822 466 92257	
223	4822 401 61207	
224	4822 520 40177	
226	4822 530 80503	
227	4822 528 90638	
228	4822 492 51902	
229	4822 466 61587	
231	4822 528 81329	
232	4822 402 50276	
233	4822 492 51935	
234	4822 256 30274	
235	4822 535 71262	
236	4822 492 32883	
237	4822 528 90639	
238	4822 691 30209	
239	4822 402 61196	
241	4822 361 20998	
242	4822 492 63076	

EXPLODED VIEW CABINET



ELECTRICAL MEASUREMENTS AND ADJUSTMENTS



PRS 05932
T27/918

A-1 µP - SIGNALS

Signal	Mode	◇			Remarks
Reset	Power on	14		Pulse "high"	
X-TAL	Stand-by	13		4 MHz	See frequency on x-tal
TRAY IN	Push tray	83		"high"	"high" when tray is closing
TRAY OUT	Open/close	83		"low"	"low" when tray is opening
$\overline{ATSB}$	DISC, SEARCH	89		"high"	"low" during search
I²C	Power on, play	31		Activity	"high" when starting up

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B-2 B0, B1, B2, B3 SIGNALS

Signal	Mode	◇			Remarks
B0	Service position 0 or 1; search »	36		"low"	
	Service position 0 or 1; search «	36		"low"	
B1	Service position 0 or 1; search »	34		"high"	
	Service position 0 or 1; search «	34		"high"	
B2	Service position 0 or 1; search »	33		"low"	
	Service position 0 or 1; search «	33		"high"	
B3	Service position 0 or 1; search »	32		"high"	
	Service position 0 or 1; search «	32		"high"	

T-22382B

B-3 CHECK OF THE PHOTODIODES

Step	Signal	Mode	◇	∅			Remarks
1	–	power on	4 6 7 8	–	–	See drawing 38314A12	Signal depends on Distance lens ↔ IR LED of remote control

T-22382C

B-4 CHECK OF LASER SUPPLY

The laser, the lasersupply plus the monitor diode form a feedback system.
A defect in the lasersupply may result in the destruction of the laser. If, in that case, the laser is replaced, (= complete C.D.M.-unit) the new laser will also become defective. However, it is impossible to check and repair a feedback system if a link is missing. For this reason the laser supply can be checked with the replacement circuit for laser assembly.

Step	Signal	Mode	◇	∅			Remarks
1	LO	serv. pos. 2 SK	9 V	–	1.8<V <2.3	–	PRS05539
	LM		11 V	–	170<mV <220	–	
2	LO	serv. pos. 2 SK	9 V	–	1.8<V <2.3	–	PRS05540
	LM		11 V	–	170<mV <220	–	
3	LO	Power on	9 V	–	0V ± 0.2V	–	No light

T-22382D

B-4 LASER CURRENT ADJUSTMENT

Step	Signal	Mode	◇	∅			Remarks
1	–	Power off	11 Ω	R3520	1kΩ	–	Pre-adjustment Ohmic value
2	Eye-pattern HF	Power on Test disc 5 play	pin 32 decoder A (SAA7310)	–	–	See drawing 37017B8	If no signal see "start up procedure"
3	laser current ≙ voltage across R3508	Test disc 5 play track 1	1 V 2	R3520	50 mV DC	–	Use a high ohmic voltage meter

T-22382E

B-5 ADJUSTMENT OF FOCUS-OFFSET

Step	Signal	Mode	◇	∅			Remarks
1	–	Power on	–	R3568	–	–	adjust for optical mid-position of the focus motor
2	FE LAG	Play Test disc 5 Track 1	27	R3568	400mV ± 40 mV DC	–	fine adjustment

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B-5 FOCUS ACTION

Signal	Mode	◇			Remarks
SI/$\overline{RD}$	Service position 1 when repeating start up procedure	21			See drawing MDA.01403
FE	Service position 1, no disc	26			See drawing MDA.01413
FE-LAG	Test disc 5A, play	27		pulse "high"	See adjustment of focus-offset

T-22382G

C-1 HIGH SPEED DISC ROTATION

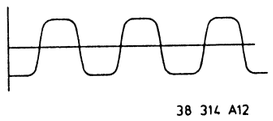
Signal	Mode	◇			Remarks
HFI	Test disc 5, play or service position 2	65			See drawing: 37017B8
X-tal	Test disc 5A, play or service position 2	70		11.28 MHz	
MC	Test disc 5, play or service position 2	12			See drawing: 38849A12

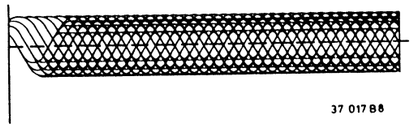
T-22382H

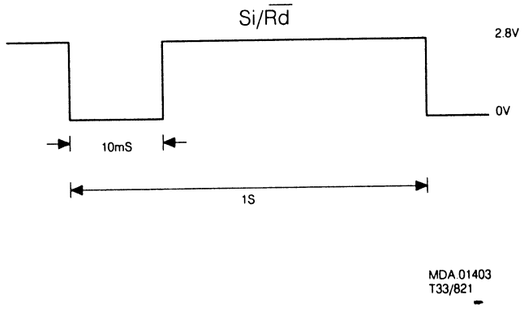
C-2 TRACK FOLLOWING

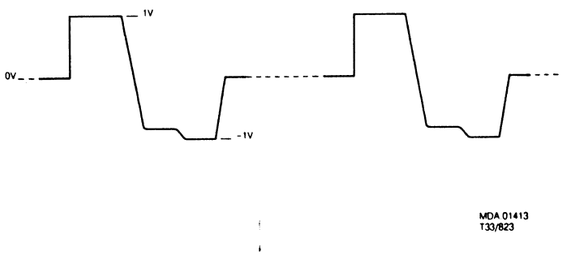
Signal	Mode	◇			Remarks
RE dig	Test disc 5, play or service position 3	37			Square wave
RE lag		41			DC level ± 2,5 Volt
RAD+	Test disc 5A, service position 1 ≪≫	40			Arm inside: 1V Arm outside: –1V
C osc1	Test disc 5, play or service position 3	30		650 Hz	
C osc2	Test disc 5, play or service position 3	31		650 Hz	
LEAD	Position stop	35		650 Hz	Sinus
LEAD	Position play	35			See drawing 30743B
IDAC	Position play	48			Pulses low and high when bumped against the CDM

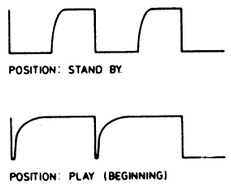
T-22382I

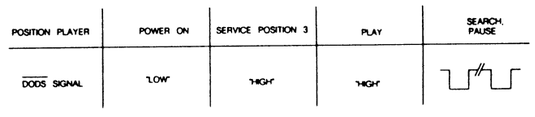


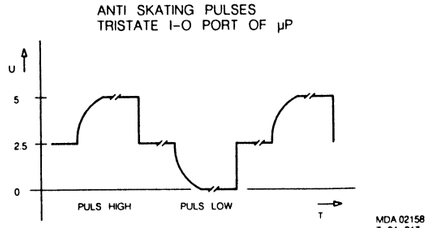


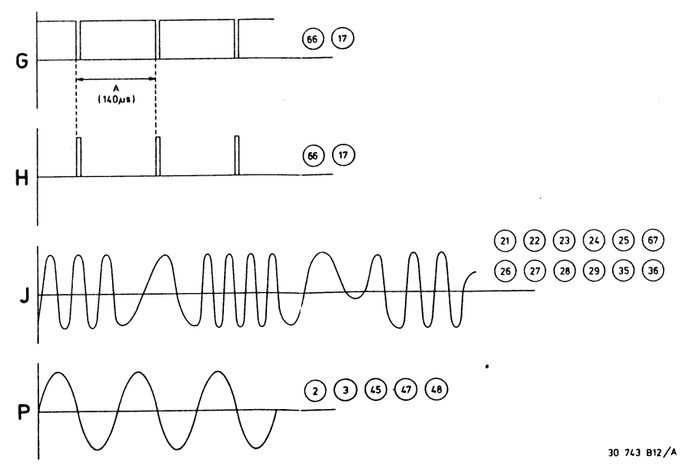












D1 JUMP TO TRACK 1

Signal	Mode	◇			Remarks
$\overline{\text{DODS}}$	Test disc 5A search ≫ or search ≪	19			See drawing MDA.01143
QRA	Test disc 5A, play	75			} See drawing MDA.00453
QDA	Test disc 5A, play	77			
QCL	Test disc 5A, play	76			
SWAB/SSM	Test disc 5A, play	78			See drawing MDA.00239
SCAB	Test disc 5A, play	79			See drawing MDA.00239
SDAB	Test disc 5A, play	80			See drawing MDA.00239

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D-2 NO AUDIO OUTPUT LEFT+RIGHT

Signal	Mode	◇			Remarks
CLAB	Disc, play	72			See drawing 38847C12
DAAB	Disc, play	73		activity	
EFAB	Testdisc 5A	74		pulses "high"	When the disc is slowly braked by hand
$\overline{\text{CLBD}}$	Disc, play	87			See drawing 38848C12
DABD	Disc, play	86		activitiy	
WSBD	Disc, play	85			See drawing 38848C12
$\overline{\text{MUSB}}$	Disc, play	90		"high"	Pulse low when track ≪/≫

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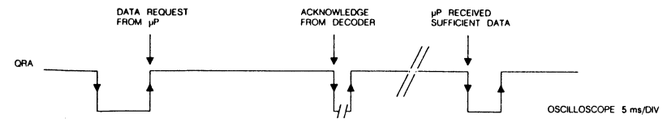
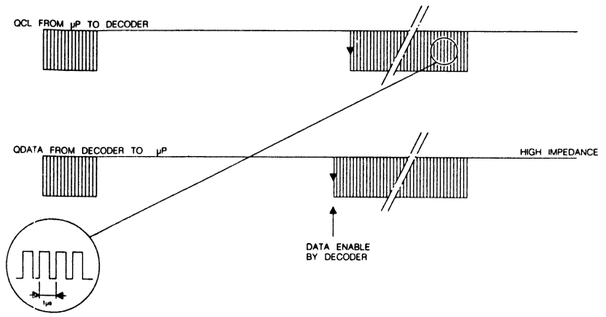
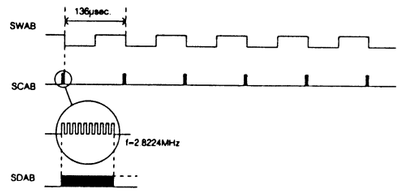
D-5 DEEM CIRCUIT

Signal	Mode	◇			Remarks
DEEM	Test disc 5A: track 14 PLAY track 15 PLAY	84		"low" "high"	See testpoint 92 and 91 on DEEM circuit
Testpoint 92	Test disc 5A track 14	92		LF signal	
Testpoint 92	Test disc 5A track 15	92		No signal	
Testpoint 91	Test disc 5A track 14	91		LF signal	
Testpoint 91	Test disc 5A track 15	91		No signal	

T-22382L



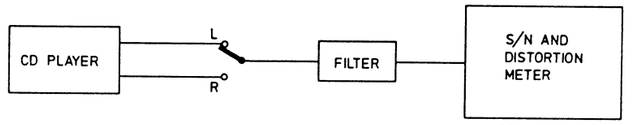




MDA 00239 T12/638

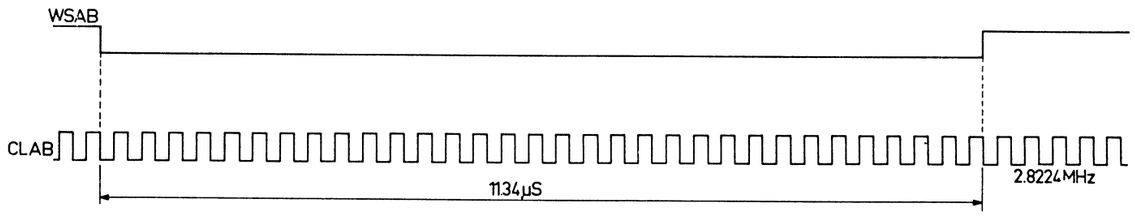
CD450

MDA 00453 T27/840

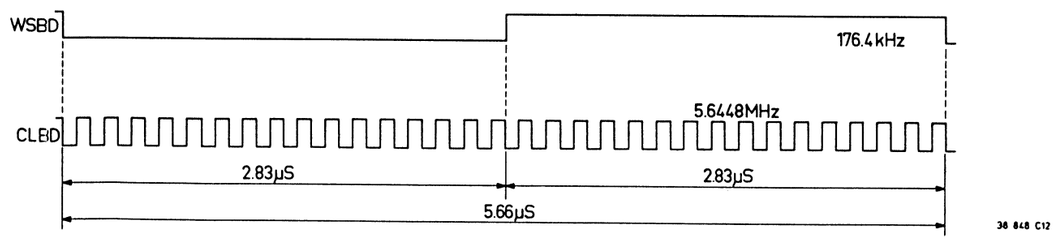


e.g. SOUND TECHNOLOGY ST 1700B

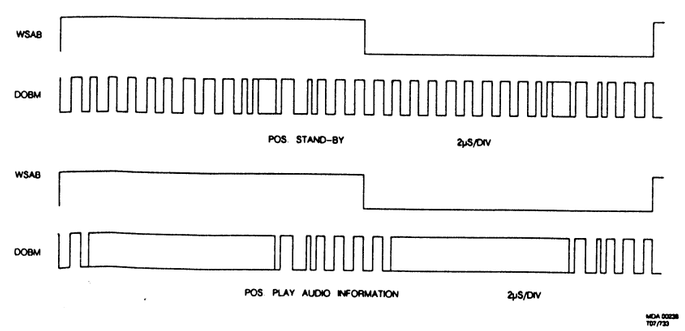
30 459 A12



38 847 C12



38 848 C12



MDA 00238 T07/733

D-6 SPECIFICATIONS MEASUREMENT

Signal	Mode	◇			Remarks
BU2-L	Test disc 3, play, total harmonic distorsion	filter output	See technial data		See drawing 30459A12
BU2-R	Test disc 3, play, total harmonic distorsion	filter output	See technial data		See drawing 30459A12
BU2-L	Test disc 3, play signal-to-noise ratio	filter output	See technial data		See drawing 30459A12
BU2-R	Test disc 3, play signal-to-noise ratio	filter output	See technial data		See drawing 30459A12

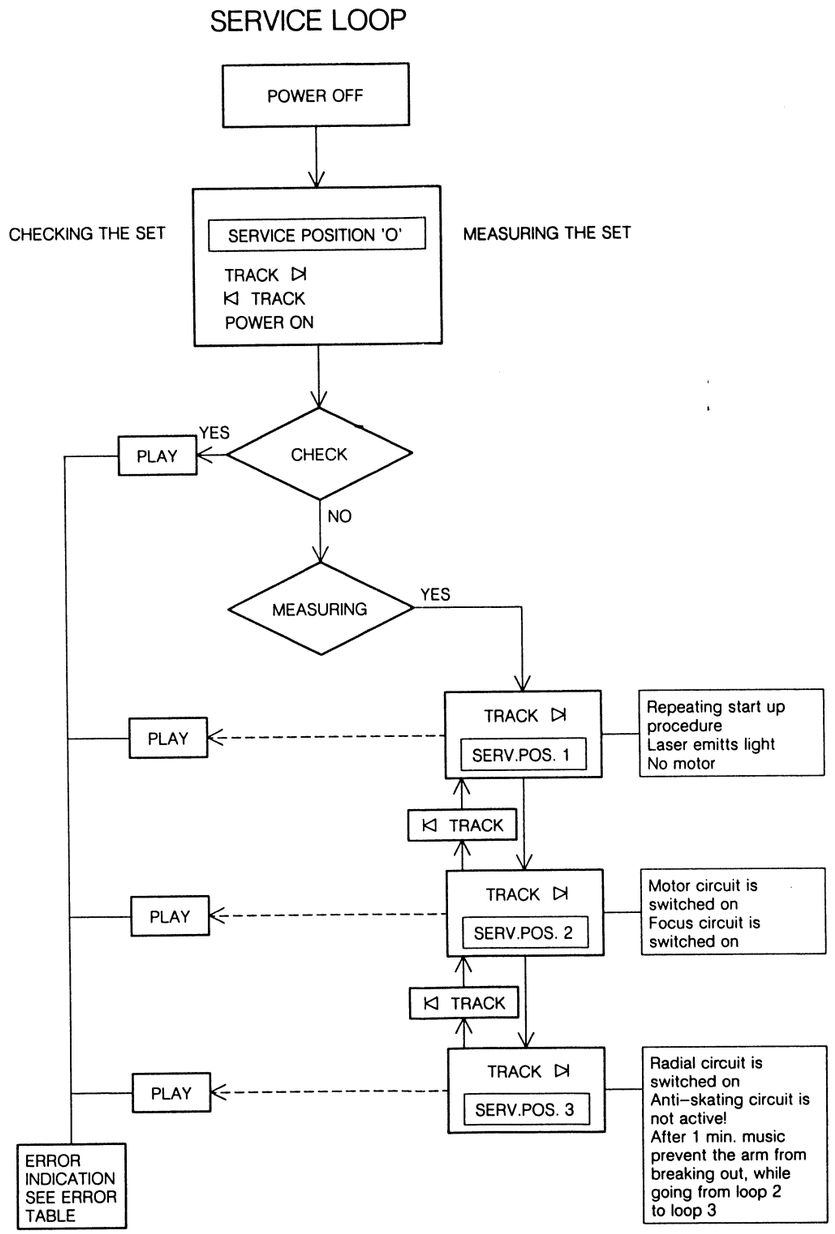
T-22382M

System errors

2 Focus error: no track loss
3 Radial start error: min excentricity point not found
6 TL error during jump: no positive TL or Rp edge during 60x8 milliseconds.
7 Subcode error: no valid subcode within 3 seconds.
8 TOC error: out of lead-in while reading TOC.

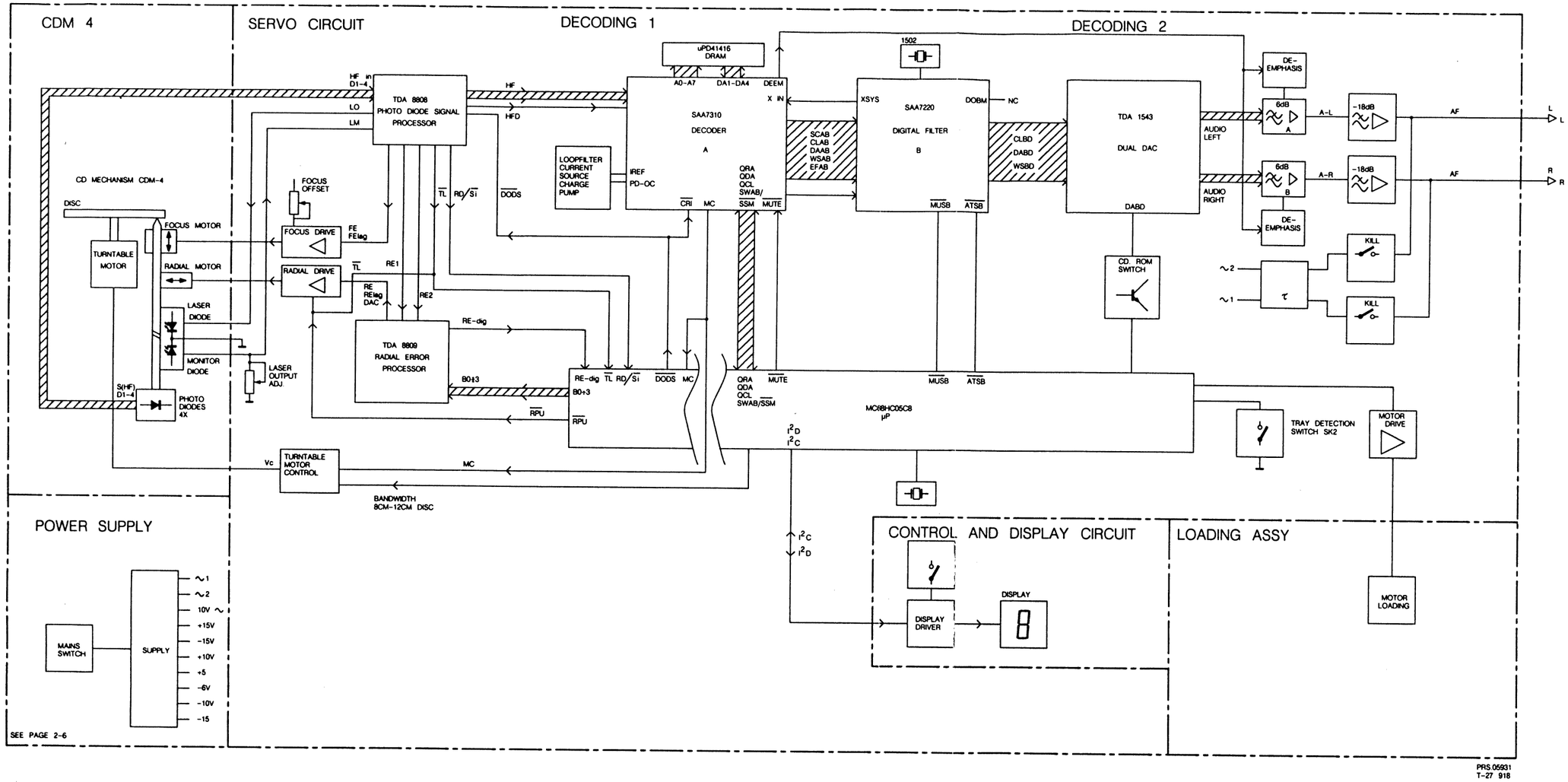
Operating errors

30 Next at a boarder when repeat is off.
31 Previous at a boarder when repeat is off.
34 No program.
35 Program memory full.
36 Programmed track is non excisting on this CD.
37 Selected track is non excisting on this CD.
40 Track key pressed when program of no valid track selection.
41 Track selected while program off.
56 AB key pressed while not in play mode.
60 Fast forward bound.
61 Fast reverse bound.



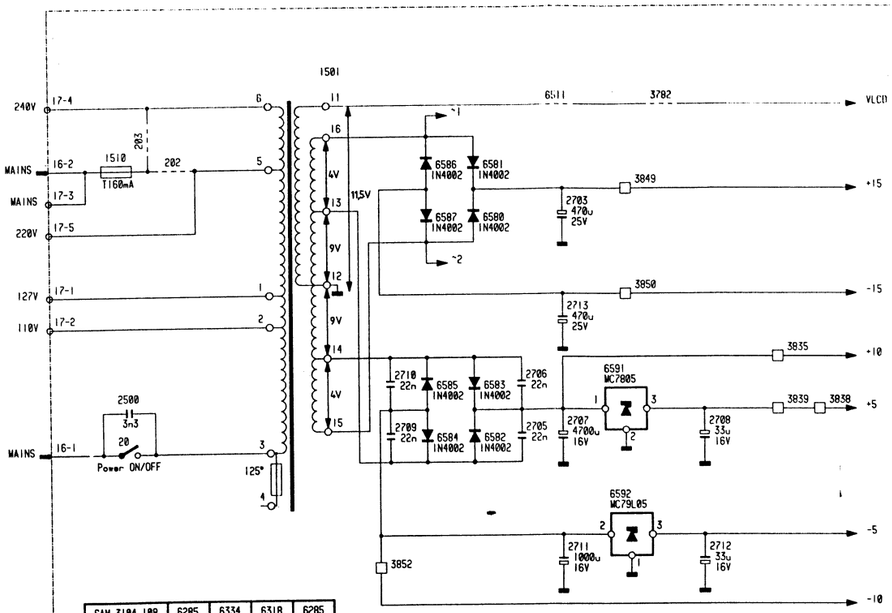
MDA.02157
T27/918

BLOCK DIAGRAM



AGC	– Automatic Gain Control	Rosc	– Resistor wobble oscillator	$\overline{ATSB}$	– Attenuation of Audio level in Search position (Cueing)
B0-B3	– Control bits for radial circuit	Rwob	– Wobble generator input	CD ROM Switch	– Digital Data information on disc signal
BEQ	– Equalizer reference current input	RE1	– Radial error signal 1 (summation of amplified currents D_3 and D_4	CEFM	– Clock Eight-to-Fourteen Modulator
BGC	– DC and LF gain control reference input	RE2	– Radial error signal 2 (summation of amplified currents D_1 and D_2	CLAB	– Clock signal Decoder-A to Filter-B
Cosc1	– Capacitor wobble oscillator	RE dig	– Radial error digital	CLBD	– Clock signal Filter-B to DAC
Cosc2	– Capacitor wobble oscillator	RE lag	– Radial error signal for LAG network	$\overline{CREF}$	– Reference Current
DEC	– Decoupling input internal bypass	Sc	– Starting up capacitor input	$\overline{CRI}$	– Counter Reset Inhibit
DET	– HF detector voltage input	Si/$\overline{RD}$	– On/off control for laser supply and focus circuit. Ready signal, Starting up procedure succesful.	DAAB	– Data signal Decoder-A to Filter-B
$\overline{DIV4}$	– Divide by 4 input	$\overline{TL}$	– Track loss output signal	$\overline{DABD}$	– Data signal Filter-B to DAC
$\overline{DODS}$	– Drop out detector suppression	TTM–	– Control voltage for turntable motor	$\overline{DEEM}$	– Deemphasis
D1+4	– Photodiode currents	TTM+	– Control voltage for turntable motor	DOBM	– Digital out signal
FE	– Focus error signal	Vext–	– Supply connection	$\overline{EFAB}$	– Error flag Decoder-A to Filter-B
FE lag	– Focus error signal for LAG network	Vext+	– Supply connection	$\overline{MUTE}$	– Mute signal
HF	– HF output for DEMOD			$\overline{MUSB}$	– Soft Mute signal
HFD	– HF detector output for DEMOD			PD/OC	– Phase detector - oscillator control
HF-in	– HF current input to HF amplifier			KBSC..	– Key board scan
HF-out	– HF amplifier and equalizer voltage output			VLCD	– Voltage liquid cristal display
LM	– Laser monitor diode input			QCL	– Q-channel Clock signal
LO	– Laser amplifier current output			QDA	– Q-channel Data signal
MC	– Motor control signal			QRA	– Q-channel Request Aknowledge
offset IN	– Offset control input			SCAB	– Subcode clock Decoder-A to Filter-B
offset OUT	– Offset control output			SDAB	– Subcode data Decoder-A to Filter-B
PLLH	– PLL on hold output			SWAB/$\overline{SSM}$	– Subcode Word/Start-stop motor signal
RADout	– output of RE2-RE1 input			WSAB	– Word select Decoder-A to Filter-B
RE	– Radial error signal (Amplified RE_2-RE_1 currents)			WSBD	– Word Select Filter-B to DAC
				XIN	– Oscillator signal in Decoder-A
				XSYS	– Oscillator signal out Filter-B

POWER SUPPLY

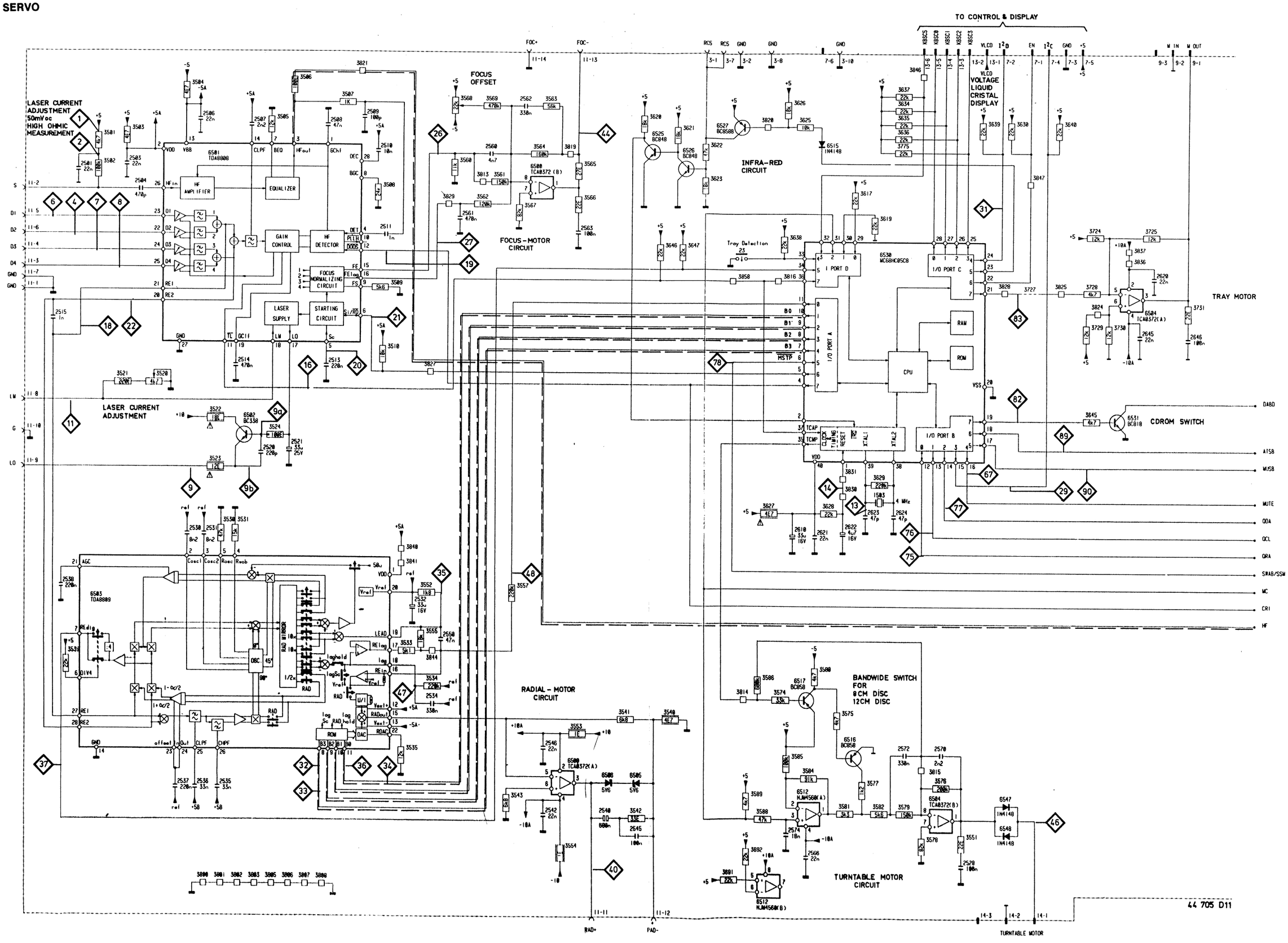


SAM 3104 108 CD 210	6205 /00	6334 /01	6318 /05 /10	6205 /07 /17
REF 0016	X	X	X	X
REF 0017	-	X	-	-
REF 0021	X	-	X	X
REF 1510	160mA	-	160mA	300mA
REF 0203	-	-	X	-
REF 0202	X	-	-	X
REF 3999	220E	2k2	1k	220E

3999
220E

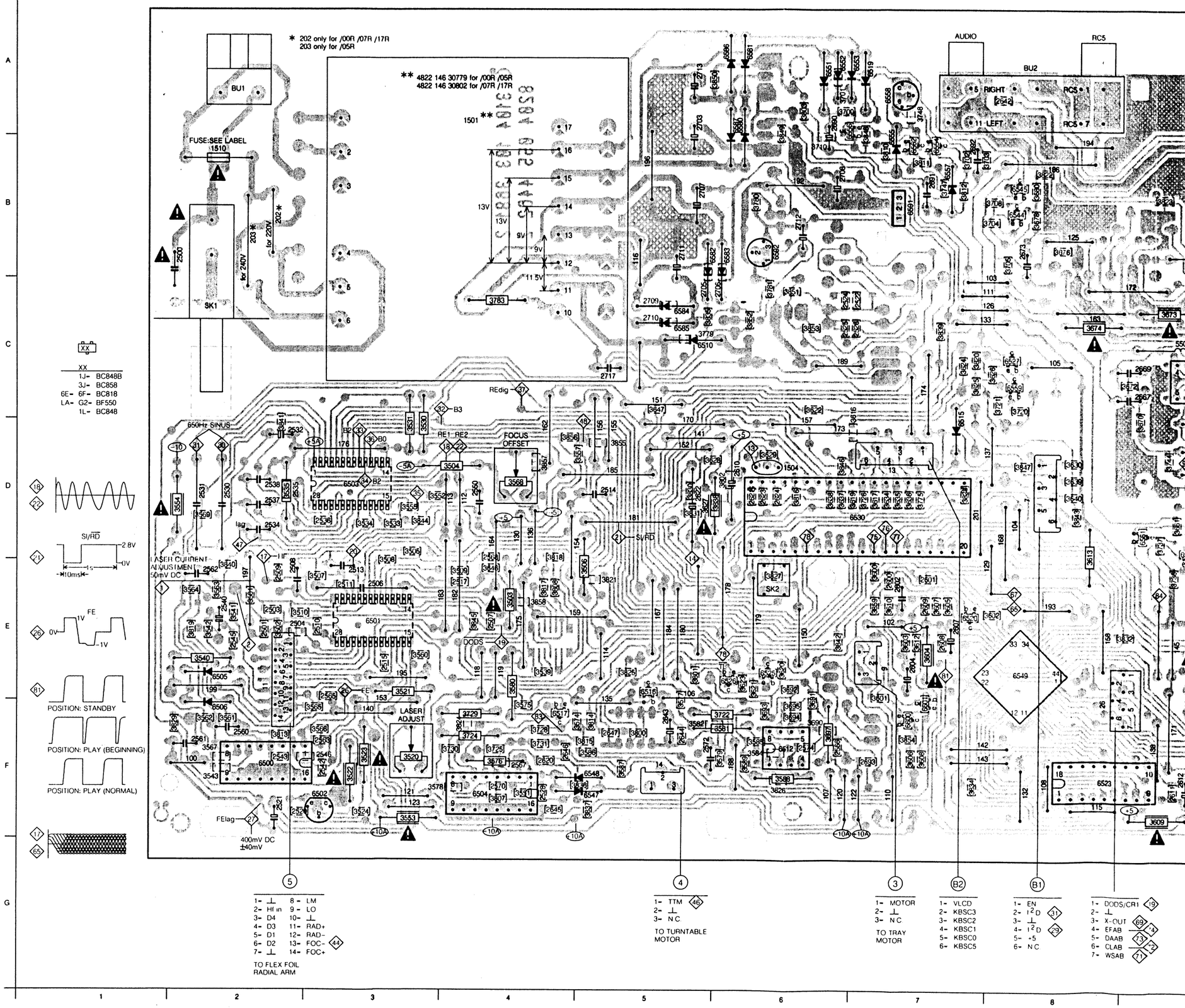
Resistor 3999 is an identification resistor for automatic measuring program selection.

44 680 C11


TO CONTROL & DISPLAY
LASER CURRENT ADJUSTMENT 50mVoc HIGH OHMIC MEASUREMENT
FOCUS OFFSET
FOCUS-MOTOR CIRCUIT
INFRA-RED CIRCUIT
VLCD VOLTAGE LIQUID CRISTAL DISPLAY
TRAY MOTOR
CDROM SWITCH
LASER CURRENT ADJUSTMENT
RADIAL-MOTOR CIRCUIT
BANDWIDE SWITCH FOR 8CM DISC 12CM DISC
TURNTABLE MOTOR CIRCUIT
6501 TDA8808
6503 TDA8809
6530 MC68HC05C8
6500 TCA8372 (B)
6504 TCA8372(A)
6512 NJM4560(A)
6512 NJM4560(B)
HF AMPLIFIER
EQUALIZER
GAIN CONTROL
HF DETECTOR
FOCUS NORMALIZING CIRCUIT
LASER SUPPLY
STARTING CIRCUIT
I PORT D
I/O PORT A
I/O PORT B
I/O PORT C
RAM
ROM
CPU
DABD
ATSB
WMSB
MUTE
QDA
QCL
QRA
SWAB/SSM
MC
CRI
HF
RAD+
PAD-
44 705 D11

CS 22 192

MAINS PANEL


* 202 only for /00R /07R /17R
203 only for /05R
** 4822 146 30779 for /00R /05R
4822 146 30802 for /07R /17R
BU1
FUSE:SEE LABEL
1510
2500
203 *
for 240V
202 *
for 220V
SK1
1501 **
13V
9V
11.5V
3783
AUDIO
RC5
BU2
5 RIGHT
11 LEFT
RC5 6
RC5 7
SK2
650Hz SINUS
FOCUS OFFSET
LASER CURRENT ADJUSTMENT 50mV DC
SI/RD
2.8V
0V
10ms
FE
1V
0V
-1V
DODS
LASER ADJUST
FElag
400mV DC ±40mV
REdig
B3
B2
B0
RE1 RE2
lag
6549
6523
6612
6630
1504
3609
3613
3604
3674
3673
3676
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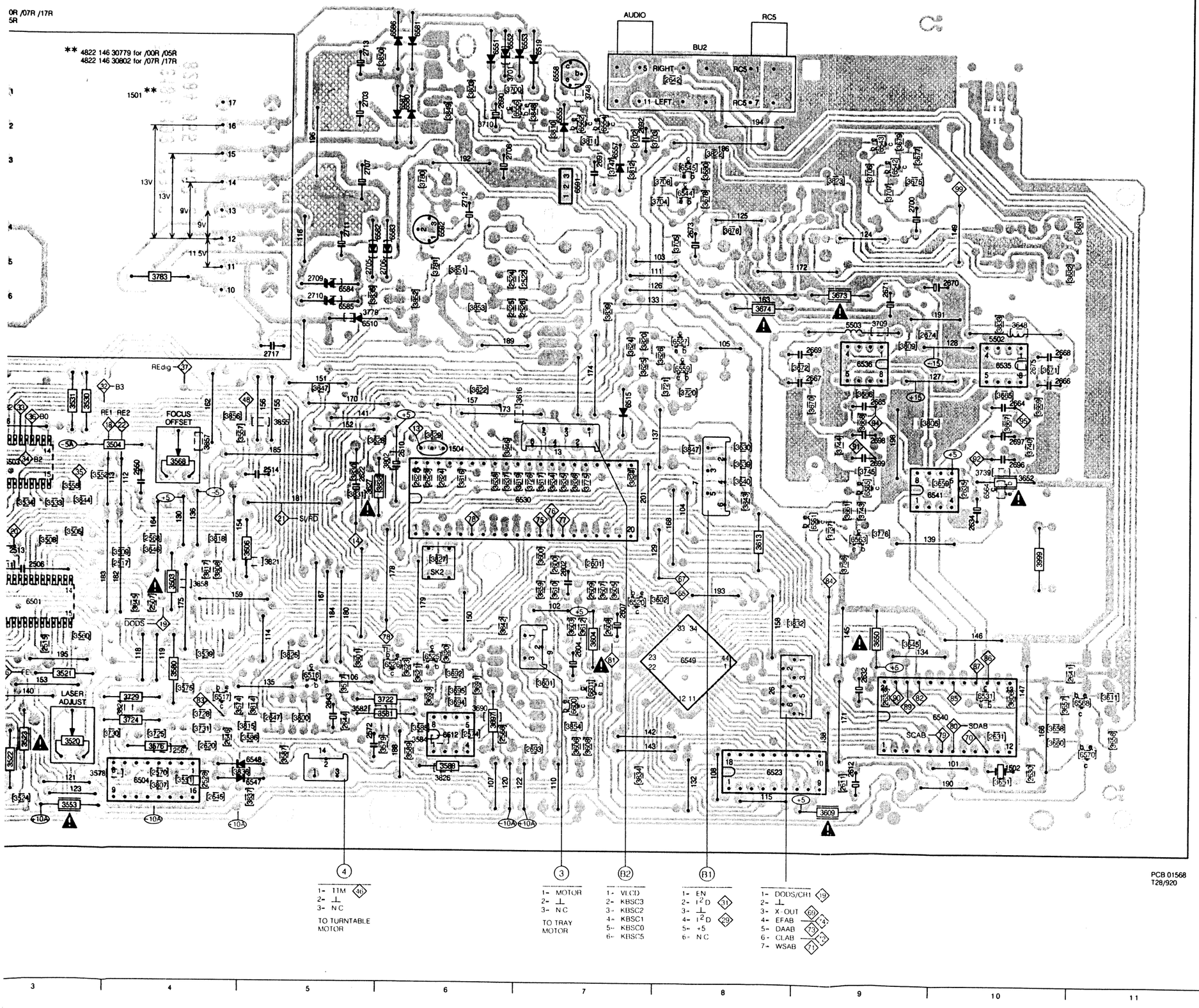

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101	F10	2532	D 2	3568	D 4	3780	B 6	6600	F 7
102	E 7	2534	D 2	3569	D 2	3781	C 6	6601	F 7
103	B 8	2535	D 2	3574	F 4	3783	C 4	7	D 8
104	D 8	2536	D 3	3575	F 4	3800	F 5	9	E 7
105	C 8	2537	D 2	3576	F 4	3801	E 5	BU1	A 2
106	E 5	2538	D 2	3577	E 5	3802	D 6	BU2	A 8
107	F 6	2540	E 2	3578	F 3	3803	A 6	SK1	C 2
108	F 8	2542	F 3	3579	F 6	3805	D10	SK2	E 6
110	F 7	2543	F 2	3580	E 4	3806	F10		
111	C 7	2545	E 2	3581	F 6	3807	F 4		
112	D 4	2546	F 3	3582	F 5	3808	E 4		
113	D 4	2550	D 4	3584	F 6	3809	C 9		
114	E 5	2560	F 2	3585	F 6	3810	B 7		
115	F 8	2561	F 2	3586	F 5	3811	B 7		
116	B 5	2562	E 2	3587	F 5	3812	B 7		
118	E 4	2563	F 3	3588	F 6	3813	F 2		
119	E 4	2565	E 3	3589	F 6	3814	F 5		
120	F 6	2566	F 6	3600	E 7	3815	F 5		
121	F 3	2567	F 4	3601	E 7	3816	D 6		
122	F 7	2568	D 4	3602	E 8	3817	E 4		
123	F 3	2570	F 4	3603	E 7	3818	D 4		
124	B 9	2572	F 5	3604	E 7	3819	E 2		
125	B 8	2574	F 6	3605	E 7	3820	C 7		
126	C 7	26	E 8	3606	F 7	3821	E 5		
127	C10	2600	E 7	3607	E 7	3822	B 8		
128	C10	2601	E 7	3608	F 7	3823	B 7		
129	E 7	2602	E 7	3609	F 9	3824	F 4		
130	D 4	2604	E 7	3610	E 7	3825	E 5		
132	F 8	2607	E 7	3611	F11	3826	E 6		
133	C 7	2608	E 7	3612	E 7	3827	F 6		
134	E 9	2609	E 7	3613	D 8	3828	D 7		
135	E 5	2610	D 6	3616	C 7	3829	F 2		
136	D 4	2611	F 9	3617	D 7	3830	D 5		
137	D 7	2612	F 9	3619	D 7	3831	D 5		
138	F 9	2620	F 4	3620	E 6	3832	E C10		
139	D 9	2621	D 6	3621	C 6	3833	F C 5		
140	F 3	2622	D 5	3622	C 6	3834	F C 5		
141	F 5	2623	D 6	3623	E 6	3835	F 5		
142	F 7	2624	D 6	3624	C 7	3836	F 5		
143	F 7	2630	F10	3625	C 7	3837	F 5		
145	E 9	2631	F10	3626	C 8	3838	D 6		
146	E10	2632	E 9	3627	D 5	3839	C 2		
147	F10	2633	F 9	3628	D 6	3840	E 2		
149	B10	2634	D10	3629	D 6	3841	D 2		
150	E 6	2635	D10	3630	D 8	3842	E 6		
151	C 5	2641	E11	3634	D 7	3843	D 8		
152	D 5	2642	A 8	3635	D 7	3844	D 3		
153	E 3	2643	F 5	3636	D 7	3845	E 4		
154	D 4	2644	F 5	3637	D 6	3846	D 6		
155	D 5	2645	F 4	3638	D 6	3847	D 8		
156	D 5	2646	F 4	3639	D 8	3848	A 7		
157	D 6	2647	F 5	3640	D 8	3849	A 6		
158	E 8	2664	C10	3645	E 9	3850	A 5		
159	E 4	2665	C 9	3646	E 4	3851	C 6		
162	D 4	2666	C10	3647	C 5	3852	C 6		
163	C 8	2667	C 9	3648	C10	3853	C 6		
164	D 4	2668	C10	3650	E 9	3854	F 7		
166	F10	2669	C 9	3651	F10	3855	D 5		
167	E 5	2670	C10	3652	D10	3856	D 4		
168	D 8	2671	C 9	3656	F11	3857	D 4		
170	D 5	2673	B 8	3657	F10	3858	E 4		
171	F 9	2674	C 9	3658	F10	3859	E 7		
172	C 9	2675	C10	3659	D10	3999	E10		
173	D 6	2690	A 6	3660	F10	5502	C10		
174	C 7	2691	B 7	3661	D 9	5503	C 9		
175	E 4	2692	B 7	3665	C10	6500	F 2		
176	D 3	2693	F 7	3666	C 9	6501	E 3		
178	E 6	2696	D10	3667	D10	6502	F 3		
179	E 6	2697	D10	3668	D 9	6503	D 3		
180	E 5	2698	D 9	3669	C10	6504	F 4		
181	D 5	2699	D 9	3670	C 9	6505	E 2		
182	E 4	2700	B 9	3671	C10	6506	F 2		
183	E 3	2703	A 5	3672	C 9	6510	C 5		
184	E 5	2705	C 5	3673	C 9	6512	F 6		
185	D 5	2706	C 6	3674	C 8	6515	C 7		
186	B 8	2707	B 5	3675	B 9	6516	E 5		
188	F 6	2708	B 6	3676	B 8	6517	F 4		
189	C 6	2709	C 5	3677	B 9	6519	A 7		
190	F10	2710	C 5	3678	B 8	6520	E 7		
191	C10	2711	B 5	3679	B 9	6523	F 8		
192	B 6	2712	B 6	3680	B 8	6525	E 6		
193	E 8	2713	A 5	3681	B11	6526	E 6		
194	B 8	2717	C 5	3682	C10	6527	C 8		
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197	E 2	3503	E 4	3692	E 6	6535	C10		
198	D 9	3504	D 4	3693	F 6	6536	C 9		
199	E 2	3505	D 3	3694	F 6	6540	F10		
201	D 7	3506	E 5	3695	F 6	6541	D10		
202	B 2	3507	E 3	3697	F 6	6542	B 9		
203	B 2	3508	E 3	3700	A 6	6543	B 9		
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14	F 5	3520	F 3	3703	B 7	6547	F 5		
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1504	D 6	3523	F 3	3706	B 9	6551	A 6		
1510	B 2	3524	F 3	3707	B 9	6552	A 6		
2500	B 2	3530	D 3	3708	B 8	6553	A 7		
2501	E 2	3531	D 3	3709	C 9	6554	B 7		
2503	E 2	3533	D 3	3710	B 6	6555	A 7		
2504	E 2	3534	D 3	3720	C 8	6556	A 6		
2506	E 3	3535	D 2	3721	C 8	6557	B 7		
2507	E 4	3539	E 4	3722	F 6	6558	A 7		
2508	E 2	3540	E 2	3724	F 4	6559	C 8		
2509	E 2	3541	E 2	3725	F 4	6561	D 9		
2510	E 3	3542	E 2	3726	D 7	6562	B 7		
2511	E 3	3543	F 2	3728	F 4	6563	D 9		
2513	E 3	3551	F 4	3729	F 4	6564	D10		
2514	D 5	3552	D 3	3730	F 4	6565	D 9		
2515	E 3	3553	F 3	3731	F 4	6568	F11		
2517	E 4	3554	D 2	3736	E 9	6570	F11		
2520	F 2	3555	D 3	3737	D 9	6580	A 6		
2521	F 2	3557	D 4	3739	D10	6581	A 6		
2522	C 7	3560	E 3	3740	D10	6582	B 5		
2524	C 6	3561	F 2	3743	D 9	6583	B 6		
2525	C 6	3562	F 2	3744	D 9	6584	C 5		
2526	C 7	3563	E 2	3745	D 9	6585	C 5		
2528	F 4	3564	E 2	3747	B 7	6586	A 6		
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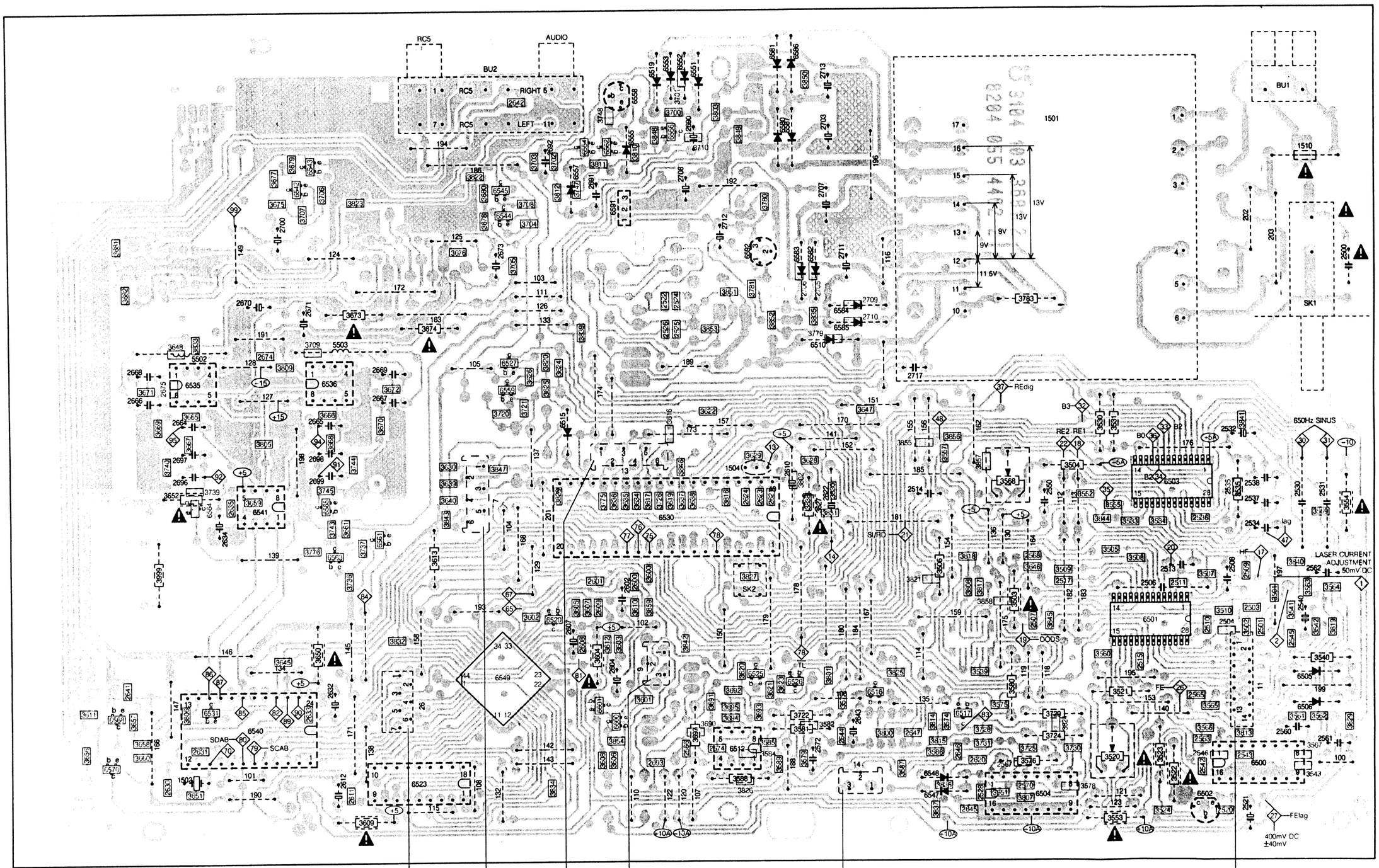
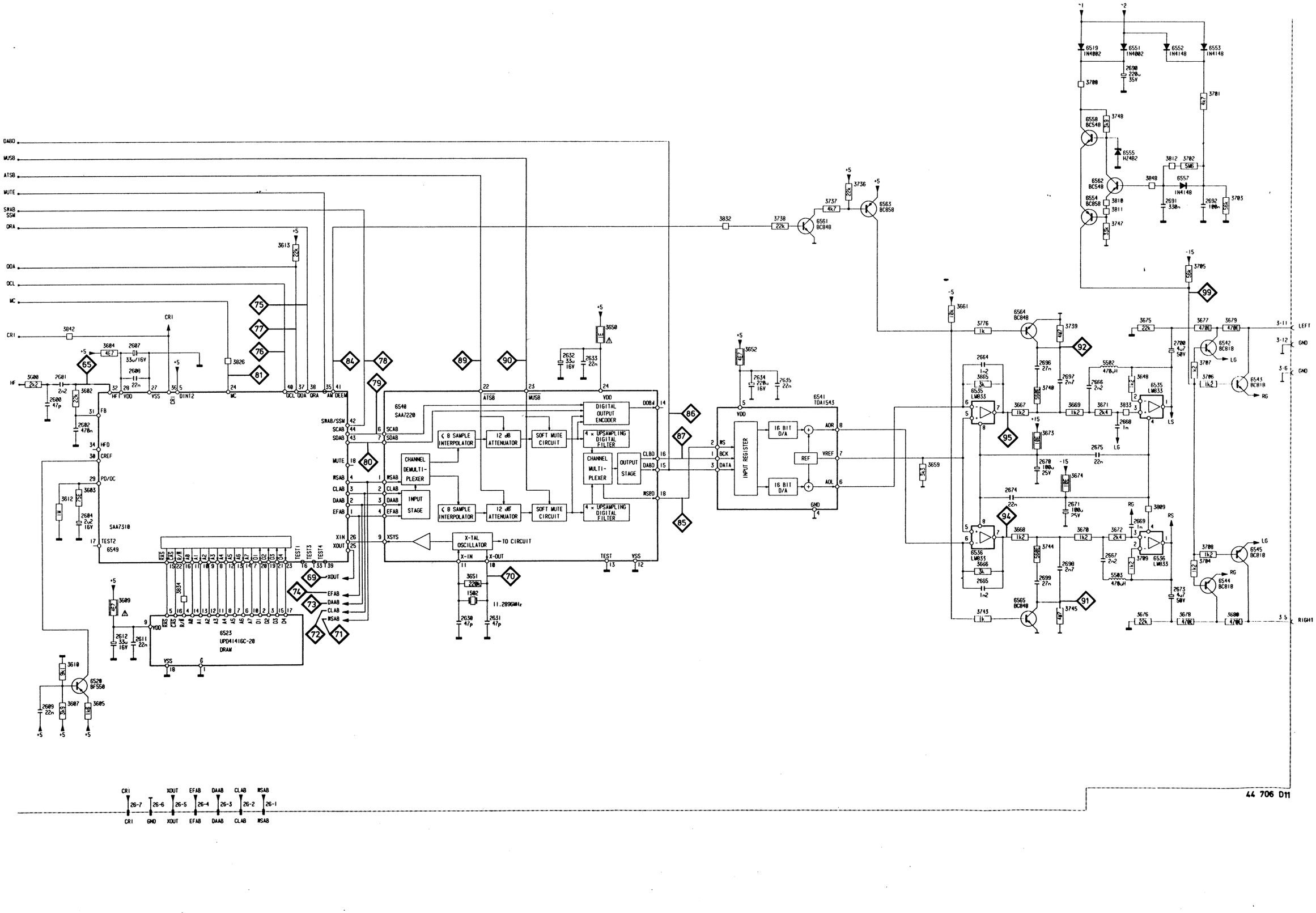
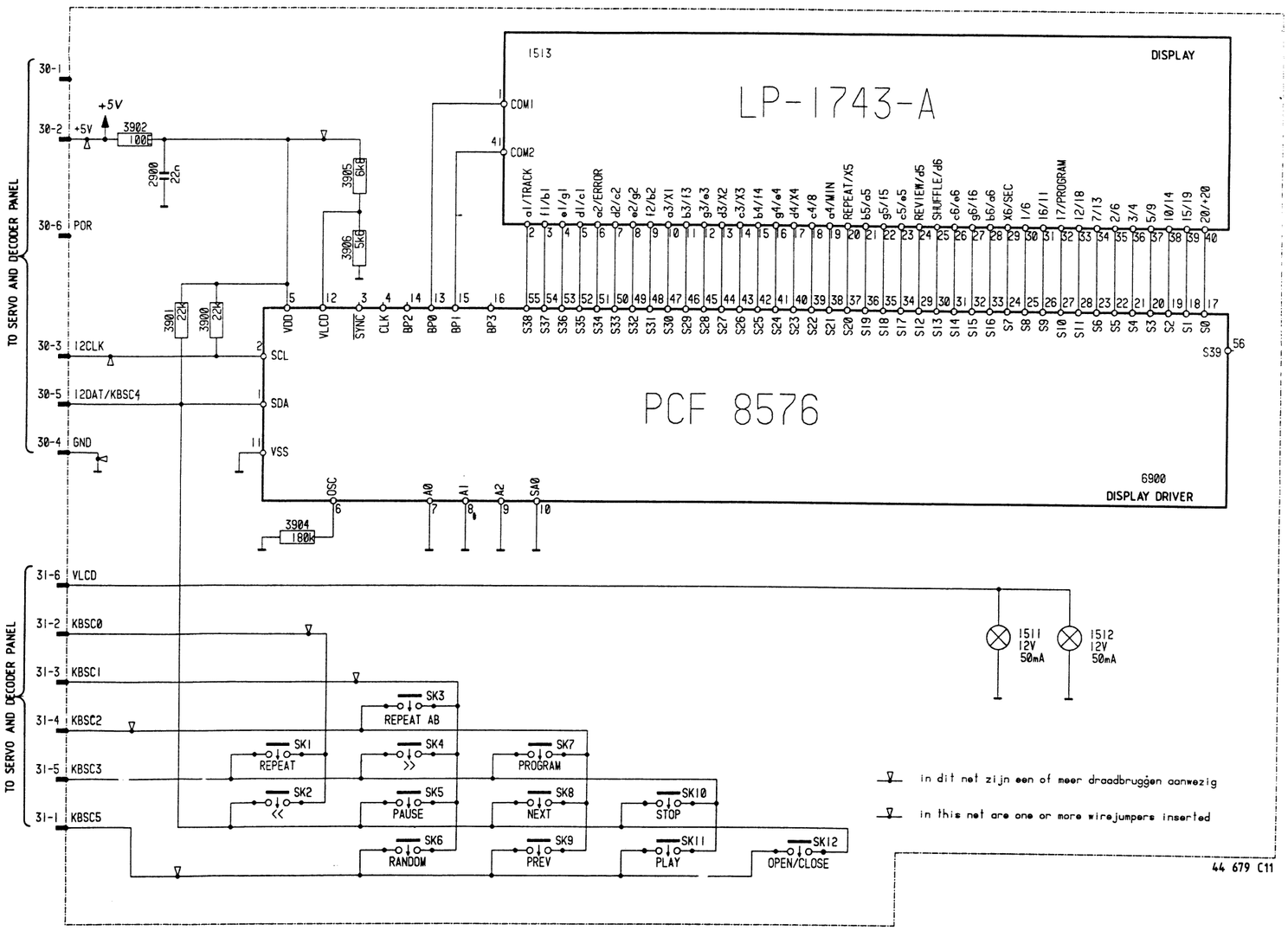
		3566	F 3	3775	D 7	6591	B 7		
				3776	D 9				


RC5
AUDIO
BU2
RC5
RIGHT 5
RC5
LEFT 11
BU1
1501
1510
SK1
SK2
13V
13V
9V
9V
11.5V
REdig
650Hz SINUS
RE2 RE1
SI/RD
LASER CURRENT ADJUSTMENT
50mV DC
Hf
Iag
DOOS
FE
SDAB
SCAB
TL
TE
FEIag
400mV DC ±40mV
1- DODS/CR1 19
2- ⊥
3- X-OUT 69 74
4- EFAB 73
5- DAAB 72
6- CLAB 71
7- WSAB
B1
1- EN
2- I²D 31
3- ⊥
4- I²D 29
5- +5
6- N.C.
B2
1- VLCD
2- KBSC3
3- KBSC2
4- KBSC1
5- KBSC0
6- KBSC5
3
1- MOTOR
2- ⊥
3- N.C.
TO TRAY MOTOR
4
1- TTM 46
2- ⊥
3- N.C.
TO TURNTABLE MOTOR
5
1- ⊥
2- Hf in
3- D4
4- D3
5- D1
6- D2
7- ⊥
8- LM
9- LO
10- ⊥
11- RAD+
12- RAD-
13- FOC-
14- FOC+ 44
TO FLEX FOIL RADIAL ARM
XX
1J= BC848B
3J= BC858
6E= 6F= BC818
LA= G2= BF550
1L= BC848
SI/RD 2.8V 0V 1s 10ms
FE 1V 0V -1V
POSITION: STANDBY
POSITION: PLAY (BEGINNING)
POSITION: PLAY (NORMAL)
PRS.01569
T28/920

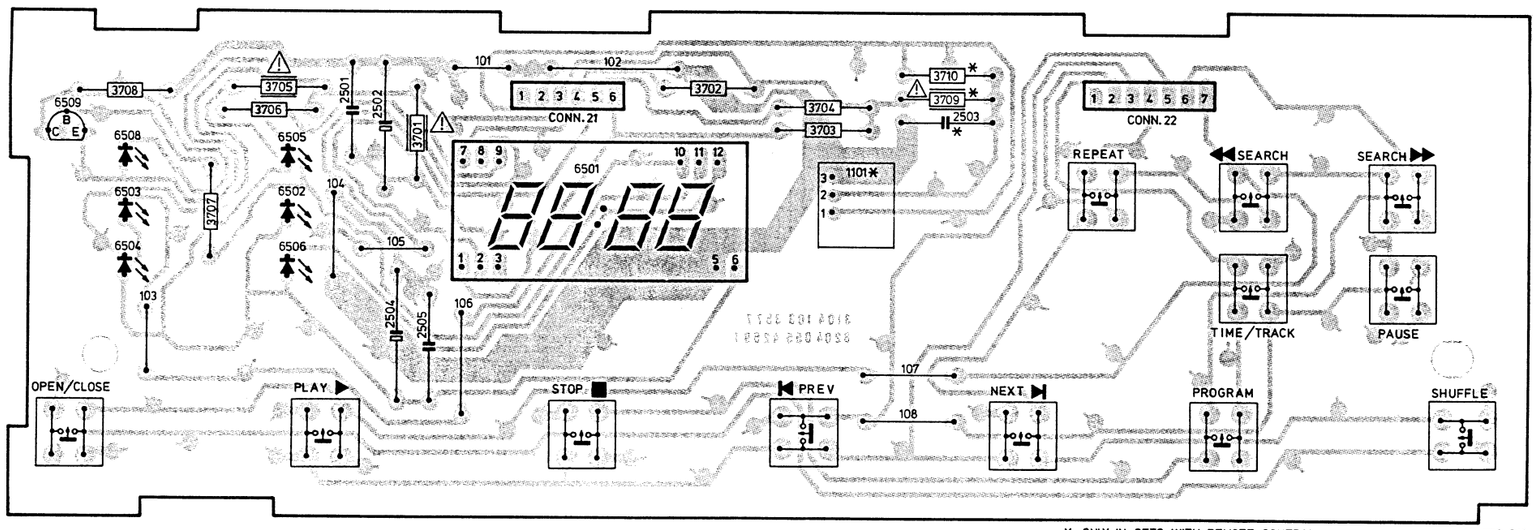
| | | |


DABD
MUSB
ATSB
MUTE
SMAB SSM
ORA
ODA
OCL
MC
CRI
HF
SAA7310
TEST2
6549
SAA7220
SMAB/SSM
SCAB
SDAB
MUTE
MSAB
CLAB
DAAB
EFAB
XIN
XOUT
8 SAMPLE INTERPOLATOR
12 dB ATTENUATOR
SOFT MUTE CIRCUIT
4 x UPSAMPLING DIGITAL FILTER
DIGITAL OUTPUT ENCODER
CHANNEL DEMULTI-PLEXER
INPUT STAGE
CHANNEL MULTI-PLEXER
OUTPUT STAGE
X-TAL OSCILLATOR
TO CIRCUIT
11.2896MHz
6523
UPD41416C-20
DRAM
6520
BF550
TDA1543
INPUT REGISTER
16 BIT D/A
REF
VREF
AOR
AOL
LM833
BC548
BC858
BC848
BC818
HZ4B2
1N4002
1N4148
LEFT
RIGHT
GND
LG
RG
LS
RS
44 706 D11
CS 22 195

CONTROL AND DISPLAY CIRCUIT



CONTROL AND DISPLAY PANEL



CONTROL & DISPLAY PARTS

ICPCF8576T	5322 209 11129
Tackt switch	4822 276 12465
Lamp 12V-50mA	4822 134 40944
Display	4822 130 90662
47µF 25V	4822 124 22027
22nF 16V	4822 122 10166
22K	4822 116 52463
100E	4822 116 52389
180K	4822 116 52502
6k8	4822 116 52441
5k6	4822 116 52438

ELECTRICAL PARTSLIST SERVO + DECODER PANEL

For non active chip components see separate list

MN4264-15	4822 209 70422
MC79L09AC	4822 209 73233
MC79M15CT	5322 209 86361
MC7905CT	4822 209 73233
TY40408 (+5V)	4822 209 71579
MC78M15	4822 209 80808
TDA8808T	4822 209 73234
TDA8809T/C2	4822 209 73235
SAA7310P	4822 209 60775
µPD41416C-20	4822 209 50582
SAA7220	4822 209 11157
TDA1543	4822 209 73236
LM833N	4822 209 83163
NJM4560D	4822 209 83274
TCA0372DP2	4822 209 72587
MC68HC05C8P	4822 209 61011

BC858	5322 130 41983
BC848C	5322 130 42136
BC848	4822 130 61207
BC328-16	4822 130 41023
BC328	4822 130 44104
BC338	4822 130 44121
BC558B	4822 130 44197
BC858 ©	5322 130 42012
BC848	5322 130 41981
BC818	4822 130 42675
BF550	4822 130 42131
BC548	4822 130 40938

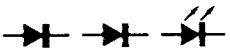
Miscellaneous

Spring clip	4822 255 40179
Cinch socket	4822 267 40766
Tackt switch (tray)	4822 276 12523
Mains switch	4822 276 11309
Mains inlet	4822 265 20291
Phone socket	4822 267 30743
Fuse holder	4822 256 30274
Mains transformer	4822 146 30701
Fuse T160mA	4822 253 30009

3N3	400 V ⚠	4822 122 40327
3N3		4822 126 10005
22N		4822 122 10166
1N		4822 122 31746
220N	63V	4822 121 42245
470N	100V	4822 121 51252
8,2M	63V	4822 121 51321
3,3N	63V	5322 122 31848
4,7N		4822 121 51314
1N2		4822 121 51309
330N		5322 121 42661
4.7M	50V	4822 124 41577
6M8	50V	4822 124 41578
33M	16V	4822 124 40272
47M	25V	4822 124 41527
100M	25V	4822 124 41528
220M	16V	4822 124 40196
220M	35V	4822 124 41572
470M	35V	4822 124 41573
1000M	16V	4822 124 41571
6800M	16V	4822 124 41591

Bipolair elco

0.68M	16V	4822 124 41583
10M	25V	4822 124 41558
100M	16V	4822 124 22339



BZV85-C6V2	5322 130 32962
BZX55-C3V9	4822 130 31981
BZX55-C12	4822 130 34197
BZX79-B5V6	4822 130 34173
1N4002	5322 130 30684
1N4148	4822 130 30621
HZ7C2/7V2	4822 130 32862
BA314	4822 130 30879
HZ3B2	4822 130 32831
HZ7A3	4822 130 33523
BAT85	4822 130 31983

CSA4.000 mHz	4822 242 70831
11289.6 kHz	4822 242 71349

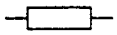
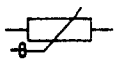
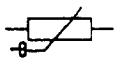
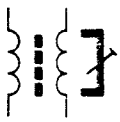
Coil 4.7 mH	4822 157 53141

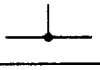
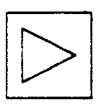
Resistors	1/3 Watt
4E7	4822 116 52858
12E	4822 111 30511
18E	4822 111 31515
100E	4822 116 52389
120E	4822 116 52394
220R	4822 116 52407
330E	4822 116 52416
750R	4822 116 52432
1K	4822 116 52391
1K2	4822 116 52395
1K8	4822 116 53109
2K2	4822 116 52408
4K7	4822 116 52426
5K6	4822 116 52438
6K8	4822 116 52925
10K	4822 116 52452
22K	4822 116 52463
47K	4822 116 52472
100K	4822 116 52973
180K	4822 116 52505
5M6	4822 116 52533
680k	4822 116 52536

Non flammable safety resistors ⚠

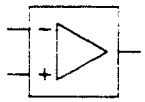
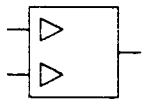
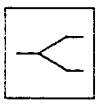
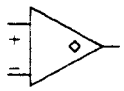
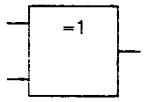
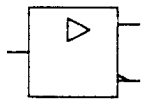
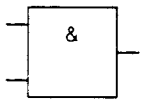
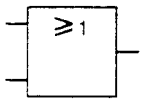
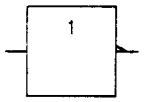
12R	4822 111 30511
1R	4822 111 30483
4R7	4822 111 30499
10R	4822 111 30508
33R	4822 111 30522
1K8	4822 116 53109
18R	4822 111 30515

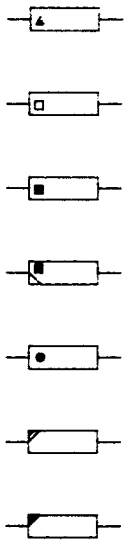
4K7	4822 101 10685
22K	4822 100 20522

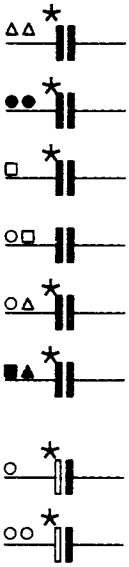
SYMBOL	DESCRIPTION
	Capacitor, general
	Electrolytic capacitor (+ and − may be omitted)
	Bipolar electrolytic capacitor (+ may be omitted)
	Resistor, general
	N.T.C. resistor
	P.T.C. resistor
	Voltage divider with preset adjustment
	Chip jumper
	Pin contact
	Bus contact
	Coil, self-induction
	Transformer with electrically poor conducting core and adjustable pre-magnetization
	Diode
	Zener diode
	Stabistor
	Double variable capacity diode (in one envelope)
	Photo conductive diode
	L.E.D.

SYMBOL	DESCRIPTION
	Transistor (N.P.N.)
	Transistor (P.N.P.)
	Direct current (DC)
	Alternating current (AC)
	Earth (functional)
	Frame or chassis connection
	Direction in which AC voltages are passed on (optional present)
	Interrupted line
	Not-connected crossing lines
	Connected lines
	Cable tree with lead-outs
	Changer, general (arrow is optional)
	Voltage Controlled Oscillator
	Band-pass filter
	Phase changing network
	Delay element
	Amplifier, general

MDA.00083
T32-735

SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
	Exclusive OR gate
	True/complement amplifier with high input
	Flip Flop
	AND gate
	OR gate
	Inverter with high input





* a=2,5V
b=4V
c=6,3V
d=10V
e=16V
f=25V
g=40V
h=63V
i=100V
j=125V
l=125V
m=150V
n=160V
q=200V
r=250V
s=300V
t=350V
u=400V
v=500V
w=630V
x=1000V
A=1,6V
B=6V
C=12V
D=15V
E=20V
F=35V
G=50V
H=75V
I=80V

MDA.00084
T32-735

Chips 50 V NP0 S1206

1 pF	5%	4822 122 32479
1,2 pF	5%	4822 122 33013
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
5,6 pF	5%	4822 122 32506
6,8 pF	5%	4822 122 32507
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
15 pF	5%	4822 122 32504
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 31961
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
1,8 nF	10%	4822 122 32153
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947
180 nF	10%	4822 122 32915
220 nF	20%	4822 122 32715

Chips 0,125 W S1206 NP0

0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90388
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392

Chips 0,125 W S1206

4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394
6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90105
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545

Chips 0,125 W S1206

6,8 k	2%	4822 111 90544
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428
10M	5%	5322 111 91141

Suppl 1 Veith.

Service Information

	1989-08-29
	CD210
	A89-119

(GB)

To adapt the Service Manual the following sheets have been changed/added.

(F)

Afin de pouvoir adapter le Manual Service les feuillets suivants ont été soit modifiés, soit ajoutés.

CORRECTIONS:

Partslist page 5-2
Miscellaneous:
Mainstransformer **4822 146 30781**

⊣⊢

N = nF
M = µF
4700µF 16V 4822 124 41458

⊣◫⊢

CSA 4.000 **MHz** 4822 242 70831

Table B-4 page 3-1

(NL)

Voor het aanpassen van de Service Manual zijn onderstaande pagina's gewijzigd/toegevoegd.

(D)

Zur Anpassung des Service Manual sind nachstehende Seiten geändert/hinzugefüght.

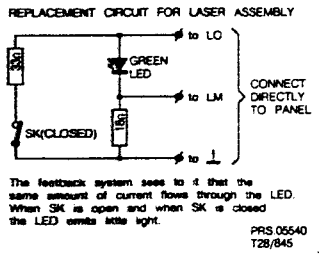
(I)

Allo scope di adattare il manuale di Servizio sono state variate/aggiunte le sequenti pagine.

Frontpage, 2-1a
2-2, 2-3a
4-2a, 4-3a
4-6a, 5-1a
6-1

B-4 CHECK OF LASER SUPPLY

The laser, the lasersupply plus the monitor diode form a feedback system.
A defect in the lasersupply may result in the destruction of the laser. If, in that case, the laser is replaced, (= complete C.D.M.-unit) the new laser will also become defective. However, it is impossible to check and repair a feedback system if a link is missing. For this reason the laser supply can be checked with the replacement circuit for laser assembly.

Step	Signal	Mode	◇	▭	Remarks
1	LO	serv. pos. 2 SK ⁄	9 — 1	1.8<V <2.3	
	LM		11 — 1	170<mV <220	
2	LO	serv. pos. 2 SK —	9 — 1	1.8<V <2.3	
	LM		11 — 1	170<mV <220	
3	LO	Power on	9 — 1	0V ± 0.2V	No light

REPLACEMENT CIRCUIT FOR LASER ASSEMBLY
to LO
GREEN LED
to LM
CONNECT DIRECTLY TO PANEL
SK(CLOSED)
to ⊥
The feedback system sees to it that the same amount of current flows through the LED. When SK is open and when SK is closed the LED emits little light.
PRS.05540
T28/845

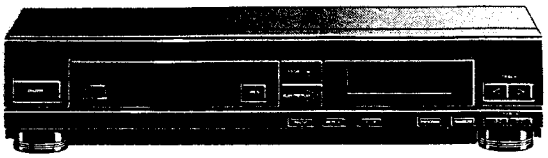
T-22511

During the change over from SK closed to SK open, the LED will emit more light for a short moment.

Compact disc player CD210

Service
Service
Service

00R/05R/60R/65R/70R



44 722 A11

Service Manual

COMPACT disc DIGITAL AUDIO

Electrically: CD210/00R ≡ CD210/60R
CD210/05R ≡ CD210/65R ≡ CD210/70R

CONTENTS

1 Contents and operation buttons
2 Technical specifications
servicing hints, loading and cabinet parts
3 Electrical measurements and adjustments
4 Blockdiagram, panel data and partslist of the main panel
5 Control and display, wiring diagram and electrical partslist
6 Changes

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

CLASS 1
LASER PRODUCT
3122 110 03420

Documentation Technique Service Dokumentation Documentazione di Servizio Huolto-Ohje Manual de Servicio Manual de Servicio

PHILIPS

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

Subject to modification
4822 725 22382
Printed in The Netherlands

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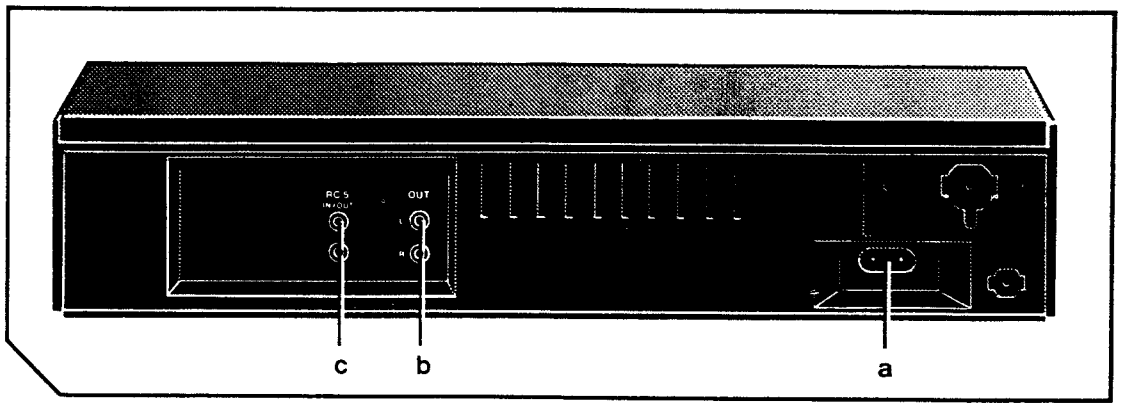
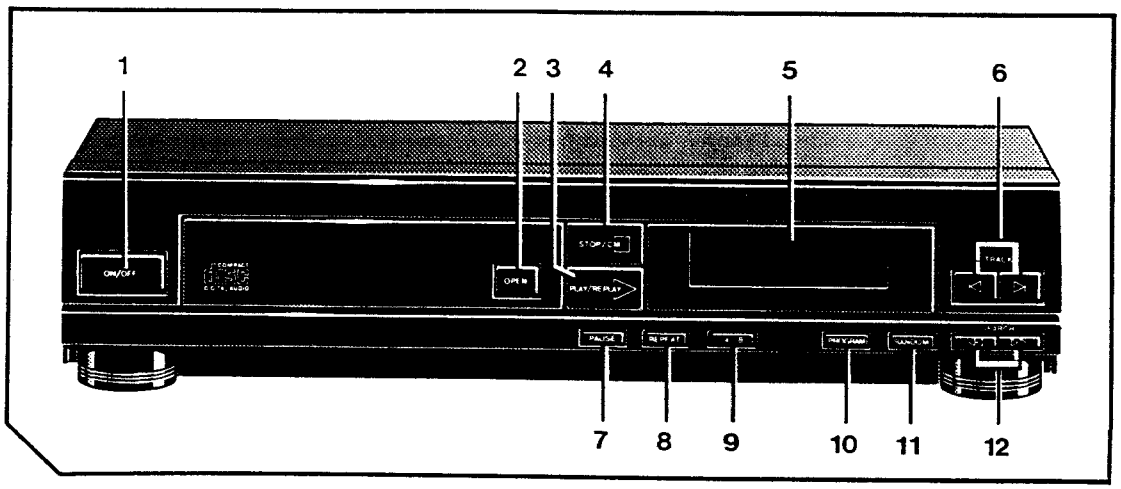
PHILIPS

Published by Service Consumer Electronics





44 723 A11

OPERATION

1 ON/OFF
2 OPEN
3 PLAY/REPLAY
4 STOP/CM
5 DISPLAY
6 ⏮ TRACK ⏭
7 PAUSE
8 REPEAT
9 A/B
10 PROGRAM
11 RANDOM
12 ⏪SEARCH⏩

a CONNECTIONS FOR THE MAINSLEAD
b OUT LEFT/RIGHT
c RC5 IN/OUT

SERVICING HINTS

In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

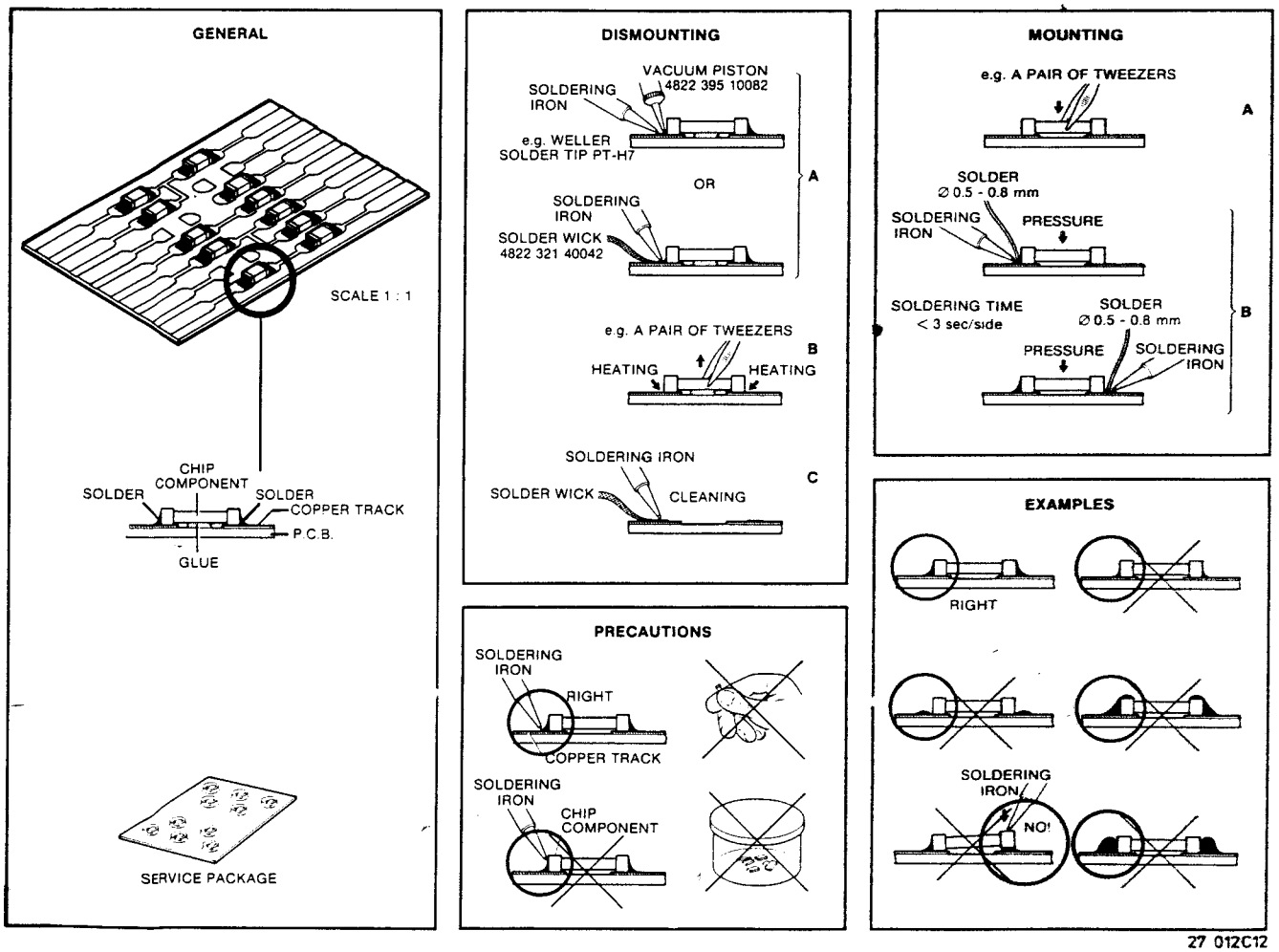
The disc should always rest properly on the turntable.
To achieve this a disc hold–down has been mounted in a bracket of the tray mechanism.
If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used. For a service disc hold–down see drawing 42565 A12.
Page 2-3

Test discs

It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

SERVICE TOOLS

Audio signal disc (1)	4822 397 30184
Disc without errors (5)+ disc with DO errors, black spots and fingerprints (5A)	4822 397 30096
Disc 65 min 1kHz without pause	4822 397 30155
Max diameter disc	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (5p)	4822 321 21273
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Glass disc	4822 395 90204



27 012C12

TECHNICAL DATA

Typical Audio Performance

- Number of Channels: 2
- Frequency Range: 2-20 000 Hz
- Output resistance: 1 KΩ
- Nominal load impedance: 100 kΩ//100 pF
- Amplitude Linearity: ± 1 dB max. (20-20 000 Hz)
- Phase Linearity: ± 1.0° (20-20 000 Hz)
- Dynamic Range: 65 dB min. (20-20 000 Hz)
- Signal-to-Noise Ratio: 75 dB min. (20-20 000 Hz)
- Channel Separation: 60 dB (20-20 000 Hz)
- Total Harmonic Distortion: 65 dB/0.05% (20-20 000 Hz)
- Wow and Flutter: quartz crystal precision
- D/A Conversion: quadruple oversampling (176.4 kHz) with digital filter and two 16 bit D/A converters
- Error Correction System: Cross Interleaved Reed Solomon Code (CIRC)
- Audio Output Level: 2 $V_{rms.}$

Power Supply

- Mains Voltage: see type plate at rear of player
- Mains Frequencies: 50 and 60 Hz
- Power Consumption: 15 W approx.
- Safety Requirements: IEC

Cabinet, general

- Dimensions (wxhxd)
  cabinet with tray closed: 360 x 80/86 x 300 mm approx.
  cabinet with tray opened: 360 x 80/86 x 445 mm approx.

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

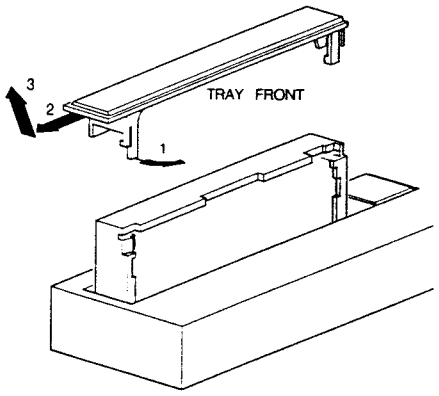
Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

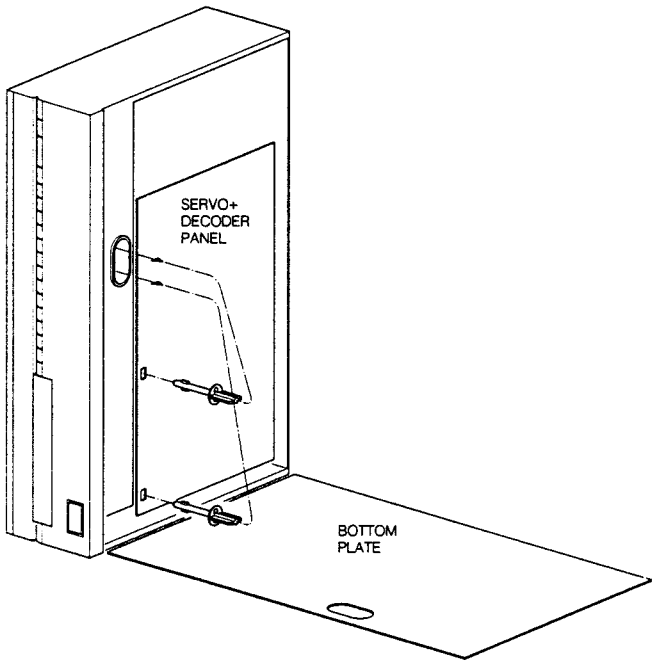
Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

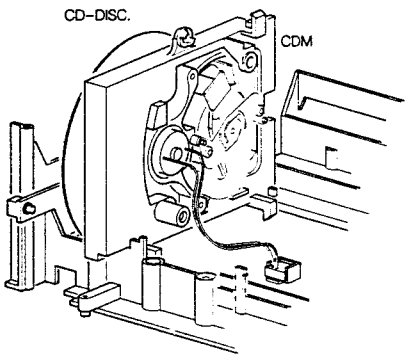


MEASURING AND ADJUSTMENT POSITION OF THE SET



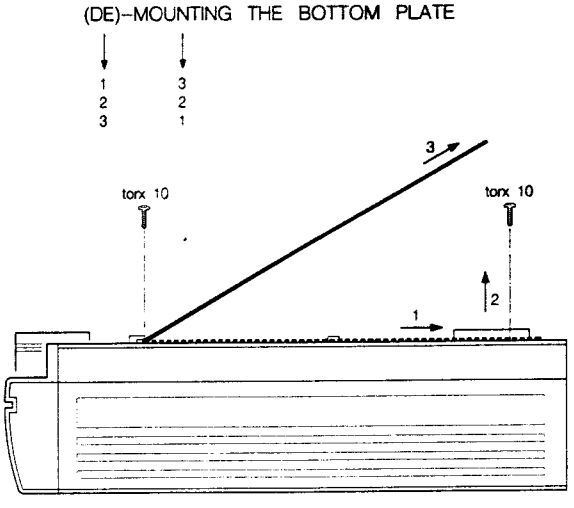
MDA.02138
916/T19

SERVICE POSITION PLAY



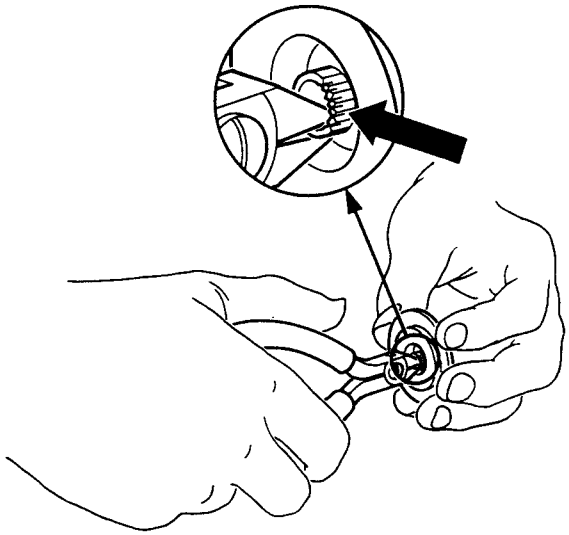
EVA.00849
916/T19

(DE)-MOUNTING THE BOTTOM PLATE



MDA 02161
T20-918

SERVICE DISC-HOLDDOWN

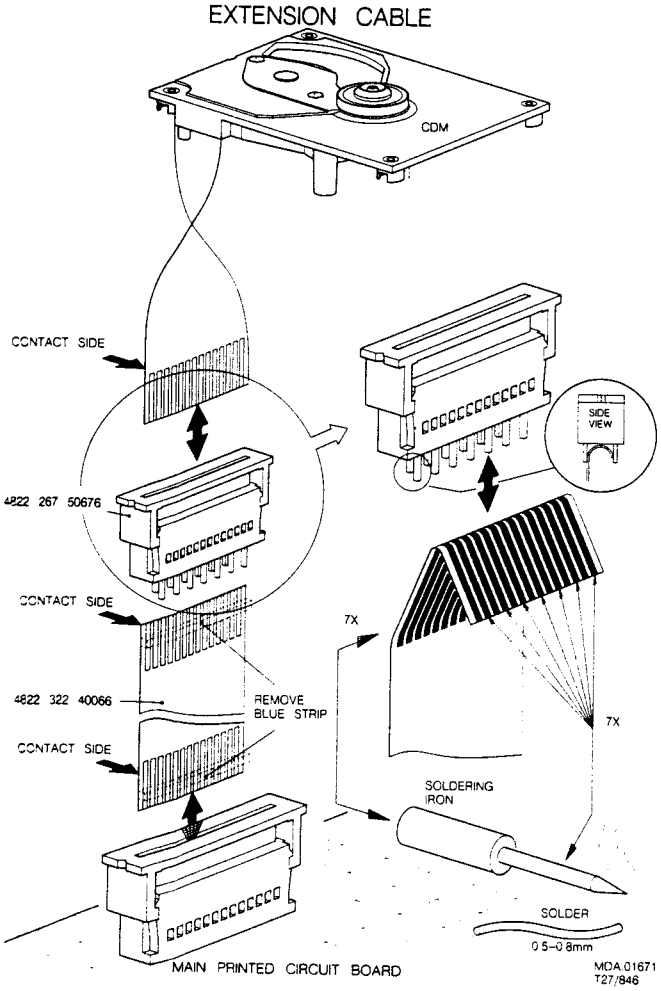


42 565 A12

Compose a service Disc hold-down in the following way

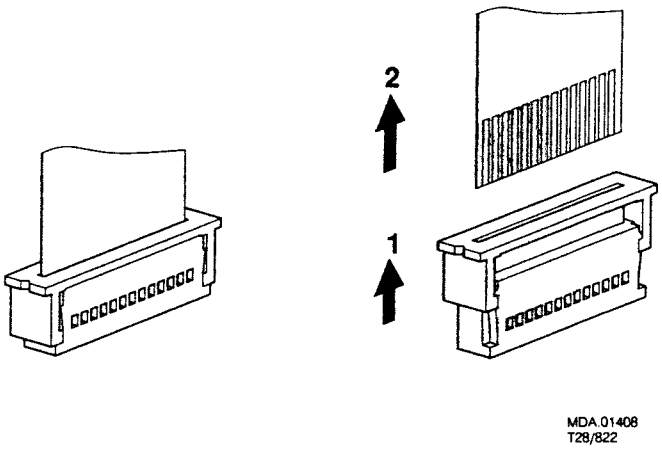
- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

SERVICE CDM FOIL



MDA.01671
T27/846

DEMOUNTING FOIL CDM



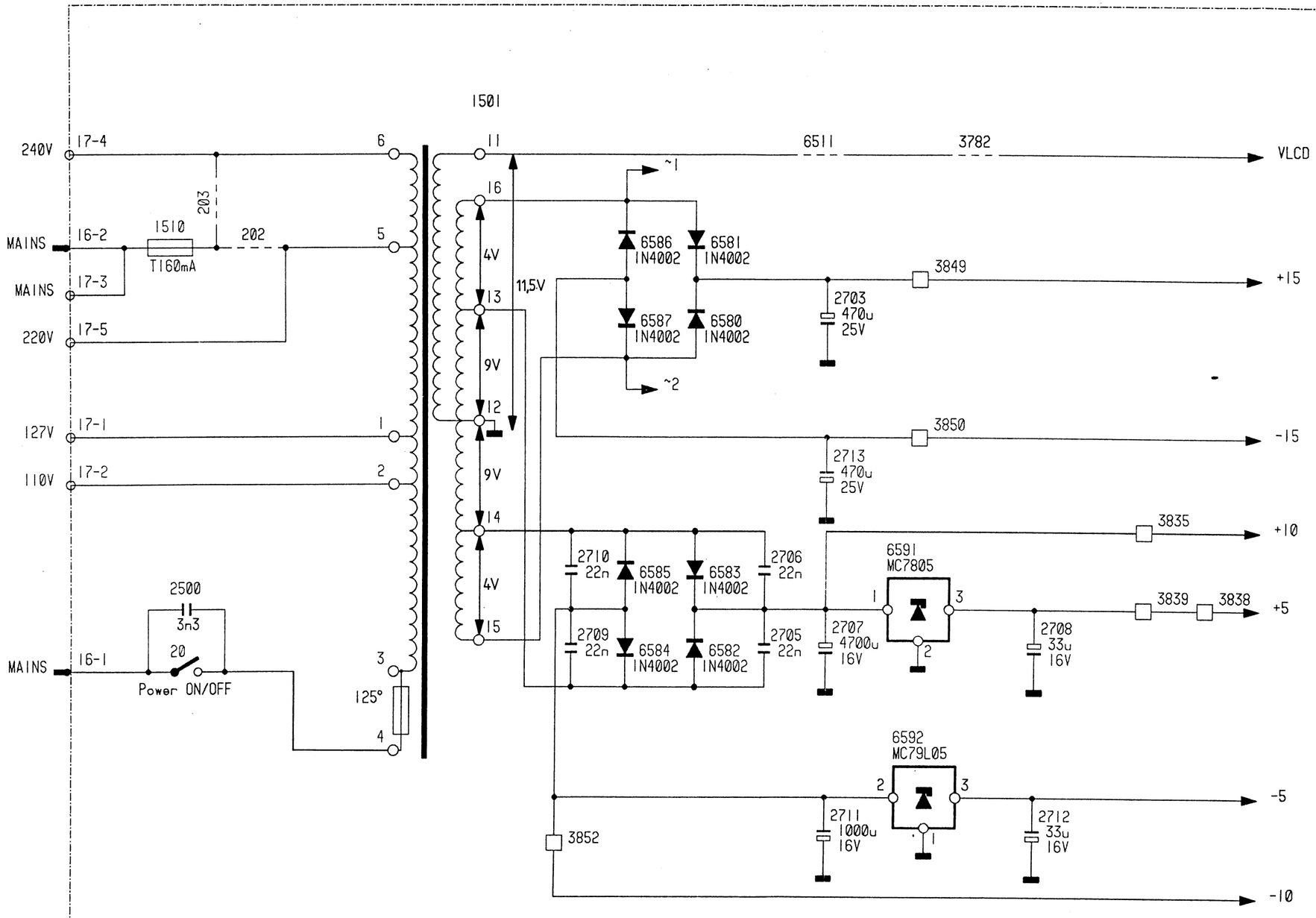
MDA.01408
T28/822

CABINET PARTS

201	4822 492 52094	
202	4822 532 51756	
203	4822 402 61252	
204	4822 444 50603	
206	4822 325 50176	
207	4822 325 50177	
208	4822 466 92251	(+ pos. 206, 207, 227)
209	4822 459 10806	
211	4822 410 60107	/00R/05R
211	4822 410 60438	/60R/65R/70R
212	4822 444 40306	/00R/05R
212	4822 444 40337	/60R/65R/70R
213	4822 381 11053	/00R/05R
213	4822 450 61479	/60R/65R/70R
214	4822 410 60106	/00R/05R
214	4822 410 60437	/60R/65R/70R
216	4822 444 40307	/00R/05R
216	4822 444 40338	/60R/65R/70R
217	4822 321 10457	/00R/60R
217	4822 321 10522	/05R/65R
217	4822 321 10523	/70R
218	4822 321 22832	
219	4822 402 61253	
221	4822 444 60568	
222	4822 466 92257	
223	4822 401 61207	
224	4822 520 40177	
226	4822 530 80503	
227	4822 528 90638	
228	4822 492 51902	
229	4822 466 61587	
230	4822 358 10115	
231	4822 528 81329	
232	4822 402 50276	
233	4822 492 51935	
234	4822 256 30274	
235	4822 535 71262	
236	4822 492 32883	
237	4822 528 90639	
238	4822 691 30209	
239	4822 402 61196	
241	4822 361 20998	
242	4822 492 63076	

Spring under item 231 4822 492 70332

POWER SUPPLY

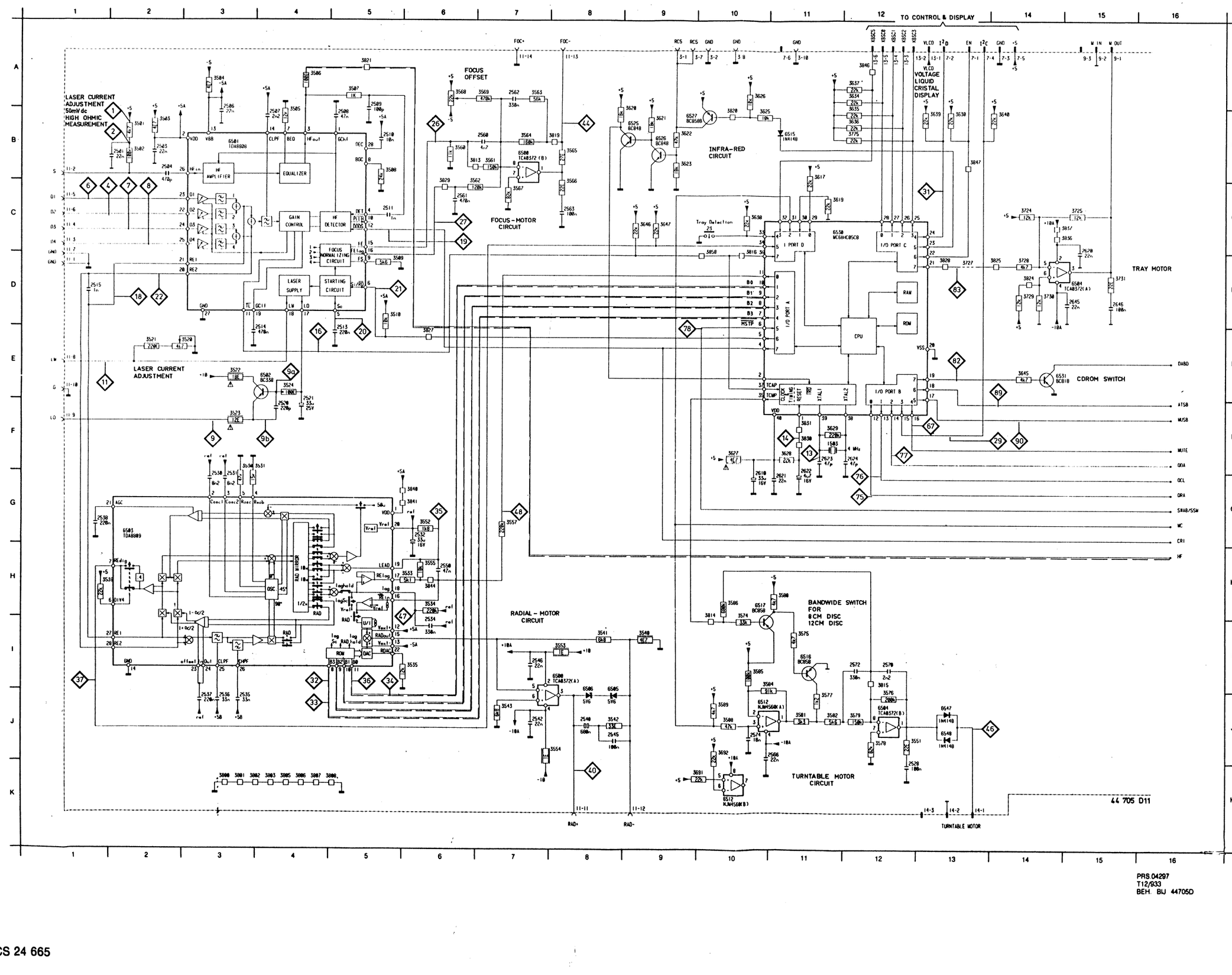


	/00R /60R	/05R /65R /70R
202	X	–
203	–	X

3999
220E

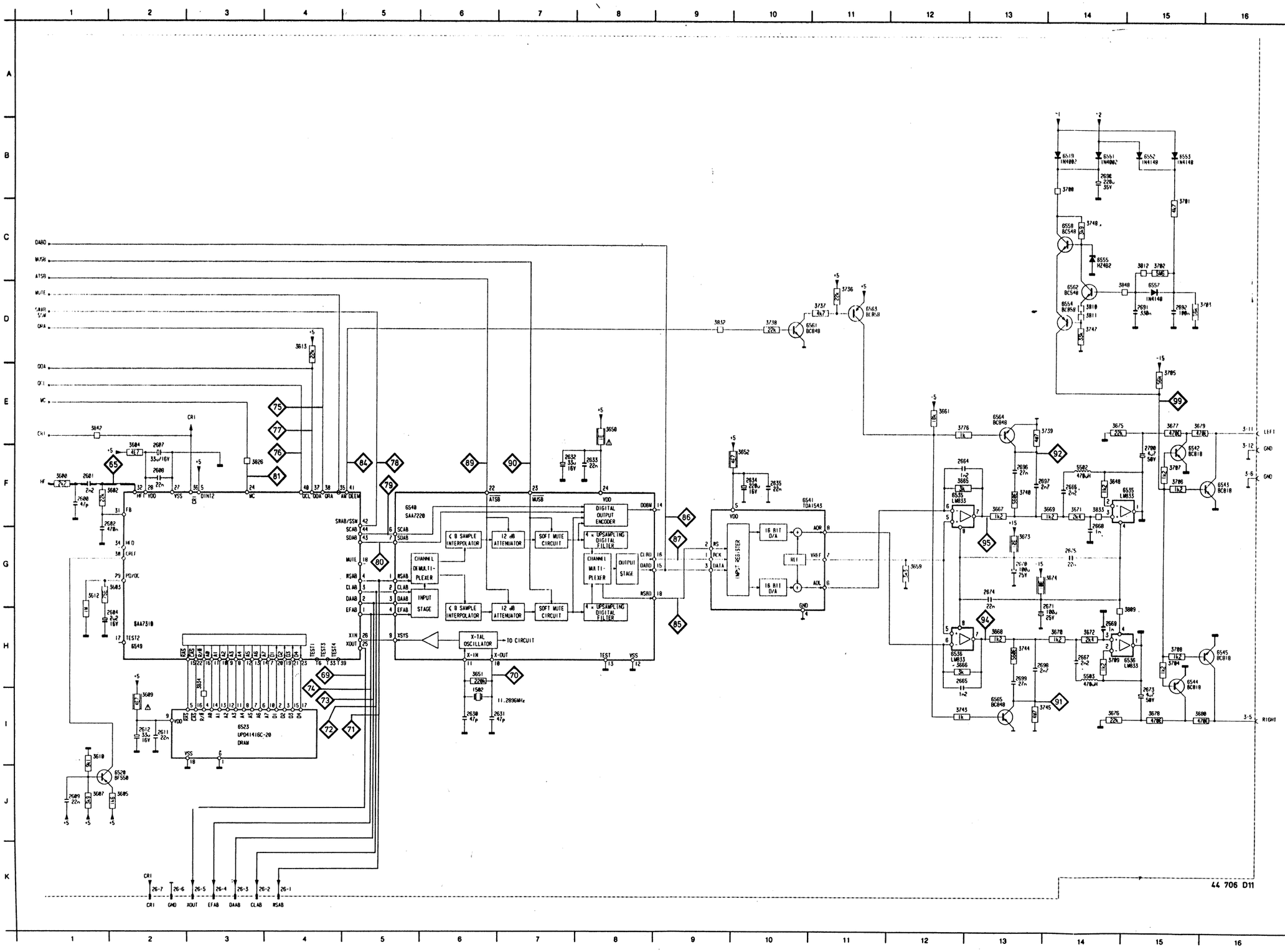
Resistor 3999 is an identification resistor for automatic measuring program selection.

44 680 C11



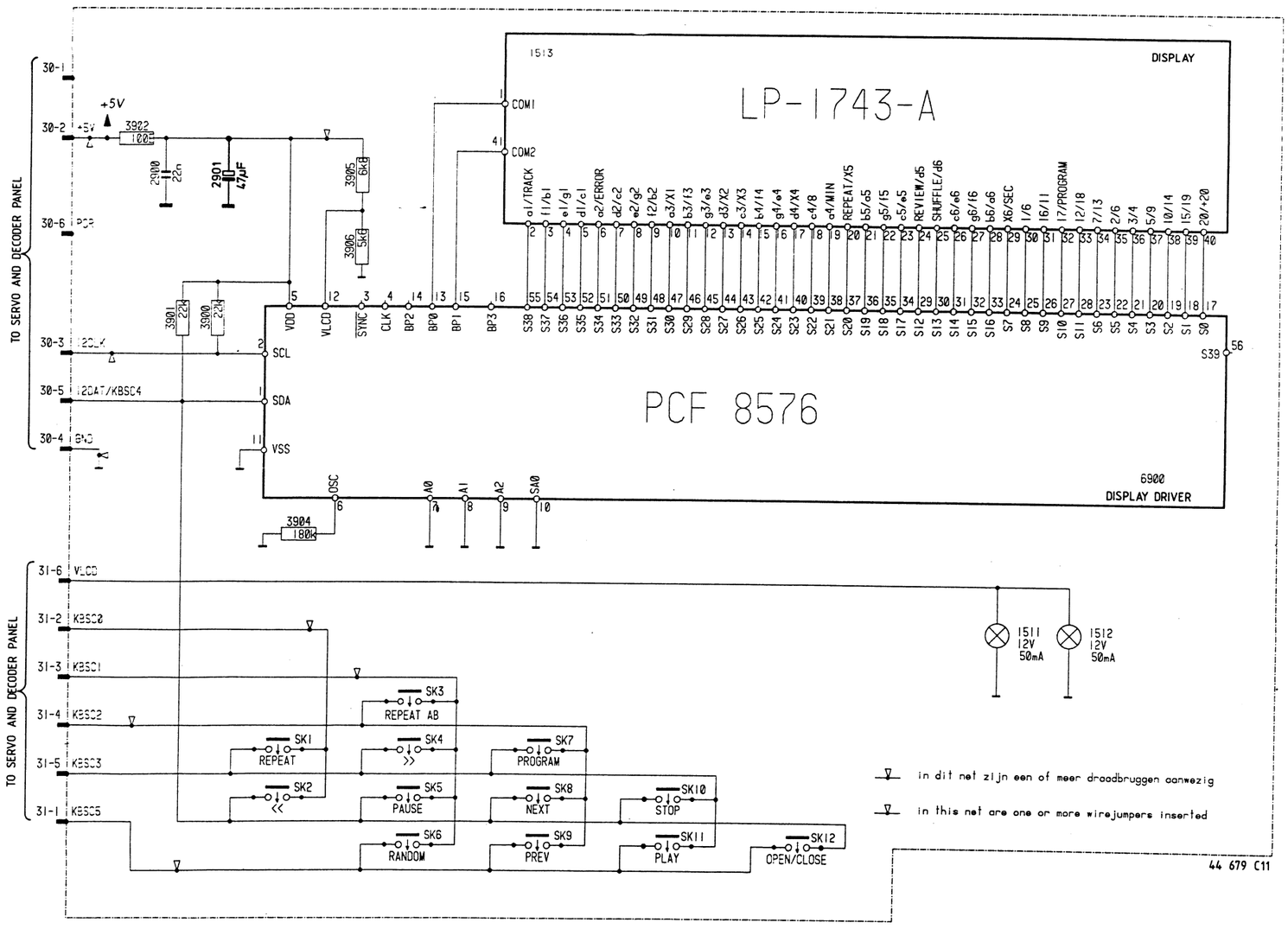
	1503	F 11	3628	F 11
	2501	B 2	3629	F 11
	2503	B 2	3630	A 13
	2504	B 2	3634	A 12
	2506	A 3	3635	A 12
	2507	A 4	3636	B 12
A	2508	A 5	3637	A 12
	2509	A 5	3638	C 10
	2510	B 5	3639	A 13
	2511	C 5	3640	A 14
	2513	D 5	3645	E 14
	2514	D 4	3646	C 9
	2515	D 1	3647	C 9
	2520	E 4	3691	K 10
	2521	E 4	3692	J 10
B	2528	J 12	3724	C 14
	2530	F 3	3725	C 15
	2531	F 3	3727	D 13
	2532	G 6	3728	C 14
	2534	I 6	3729	D 14
	2535	J 3	3730	D 14
	2536	J 3	3731	D 15
	2537	J 3	3775	B 12
	2538	G 1	3800	K 3
C	2540	J 8	3801	K 3
	2542	J 7	3802	K 3
	2545	J 8	3803	K 4
	2546	I 7	3805	K 4
	2550	H 6	3806	K 4
	2560	B 7	3807	K 4
	2561	C 6	3808	K 5
	2562	A 7	3813	B 6
	2563	C 8	3814	H 10
	2566	J 11	3815	I 12
D	2570	I 12	3816	C 10
	2572	I 12	3819	B 8
	2574	J 10	3820	A 10
	2610	F 10	3821	A 5
	2620	C 15	3824	D 14
	2621	F 11	3825	C 14
	2622	F 11	3827	D 6
	2623	F 11	3828	C 13
	2624	F 12	3829	B 6
E	2645	D 15	3830	F 11
	2646	D 15	3831	F 11
	3501	B 2	3836	C 15
	3502	B 2	3837	C 15
	3503	B 2	3840	G 6
	3504	A 3	3841	G 6
	3505	A 4	3844	H 6
	3506	A 4	3846	A 12
	3507	A 5	3847	B 13
	3508	B 5	3858	C 10
F	3509	C 5	6500	B 7
	3510	D 5	6500	I 8
	3520	E 3	6501	B 3
	3521	E 2	6502	E 4
	3522	E 3	6503	G 2
	3523	F 3	6504	D 15
	3524	E 4	6504	J 12
	3530	F 3	6505	I 8
	3531	F 4	6506	I 8
G	3533	H 6	6512	J 10
	3534	H 6	6512	K 10
	3535	I 6	6515	B 11
	3539	H 1	6516	I 11
	3540	I 9	6517	H 10
	3541	I 8	6525	B 9
	3542	J 8	6526	B 9
	3543	J 7	6527	A 9
	3551	J 13	6530	C 11
	3552	G 6	6531	E 15
H	3553	I 8	6547	J 13
	3554	J 8	6548	J 13
	3555	H 6		
	3557	G 7		
	3560	B 6		
	3561	B 7		
	3562	B 7		
	3563	A 7		
	3564	B 7		
	3565	B 8		
I	3566	B 8		
	3567	B 7		
	3568	A 6		
	3569	A 7		
	3574	H 10		
	3575	I 11		
	3578	I 12		
	3579	J 12		
J	3580	H 11		
	3581	J 11		
	3582	J 11		
	3584	I 11		
	3585	I 10		
	3586	H 10		
	3588	J 10		
	3589	J 10		
	3617	B 11		
	3619	C 11		
K	3620	A 9		
	3621	A 9		
	3622	B 9		
	3623	B 9		
	3625	A 10		
	3626	A 10		
	3627	F 10		

DECODING

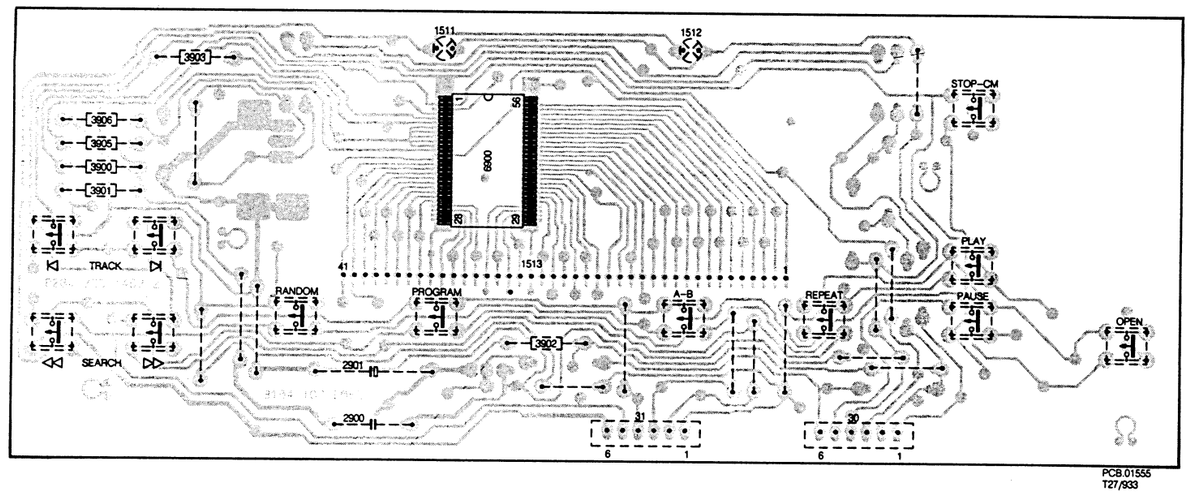


1502	I 6	6542	E15	3600	F 1
2600	F 1	6543	F16	3602	F 2
2601	F 1	6544	H15	3603	G 2
2602	F 2	6545	H16	3604	F 2
2604	H 2	6549	H 2	3605	J 2
2607	E 2	6551	B14	3607	J 1
2608	F 2	6552	B15	3609	I 2
2609	J 1	6553	B15	3610	I 1
2611	I 2	6554	D14	3612	G 1
2612	I 2	6555	C14	3613	D 4
2630	I 6	6557	C15	3648	F14
2631	I 7	6558	C14	3650	E 8
2632	F 7	6561	D11	3651	H 6
2633	F 8	6562	D14	3652	F10
2634	F10	6563	D11	3659	G12
2635	F10	6564	E13	3661	E12
2664	F12	6565	I13	3665	F12
2665	H12			3666	H12
2666	F14			3667	F13
2667	H14			3668	H13
2668	F14			3669	F14
2669	H14			3670	H14
2670	G13			3671	F14
2671	G14			3672	H14
2673	H15			3673	G13
2674	G13			3674	G14
2675	G14			3674	G14
2690	B14			3675	E14
2691	D15			3676	I 14
2692	D15			3677	E15
2696	F13			3678	I 15
2697	F14			3679	E15
2698	H14			3680	I 16
2699	H13			3700	B14
2700	E15			3701	B15
				3702	C15
				3703	D16
				3704	H15
				3705	E15
				3706	F15
				3707	F15
				3708	H15
				3709	H14
				3736	D11
				3737	D11
				3738	D10
				3739	E14
				3740	F13
				3743	I 12
				3744	H13
				3745	I 14
				3747	D14
				3748	C14
				3776	E12
				3809	H15
				3810	D14
				3811	D14
				3812	C15
				3824	E 1
				3826	F 3
				3832	D 9
				3833	F14
				3834	H 3
				3848	C14
				5502	F14
				5503	H14
				6519	B14
				6520	J 2
				6523	I 3
				6535	F12
				6535	F15
				6536	H12
				6536	H15
				6540	F 5
				6541	F10

CONTROL AND DISPLAY CIRCUIT



CONTROL AND DISPLAY PANEL



CONTROL & DISPLAY PARTS

ICPCF8576T	5322 209 11129
Tackt switch	4822 276 12465
Lamp 12V-50mA	4822 134 40944
Display	4822 130 90662
47µF 25V	4822 124 22027
22nF 16V	4822 122 10166
22K	4822 116 52463
100E	4822 116 52389
180K	4822 116 52502
6k8	4822 116 52441
5k6	4822 116 53027

CHANGES

Changed pages
Introductions with A89-119

Page	Reason
Frontpage	/60R/65R and /70R added
2-1-a	Max. diameter added
2-3-a	Partslist adapted for /60R, /65R and /70R
4-2-a	Drawing corrected
	Table adapted for /60R, /65R and /70R
4-3-a	Mapping added
4-6-a	Mapping added
5-1-a	Circuit diagram corrected
	Correct printed circuit board given

Supl 2

Service Information

	1990-04-02
	CD210
	A90-110

Product Service Group CE Audio

(GB)

To adapt the service manual the following sheets have been added/changed.

(NL)

Voor het aanpassen van het service manual zijn de onderstaande pagina's toegevoegd/gewijzigd.

(F)

Afin de pouvoir adapter lr "manual service" les feuillets suivants ont été soit modifiés, soit ajoutés.

(D)

Zür anpassung des Service Manual sind die nachstehenden Seiten hinzugefügt/geändert.

(I)

Le seguenti pagine sono state cambiate/aggiunte allo scopo di adattare il Manuale di Sevizio

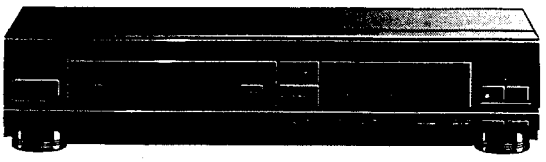
1-1c ; 2-1a
2-2 ; 2-3c
6-1 ; 6-2

Service
Service
Service

Compact disc player CD210

Service
Service
Service

00R/05R/10G/60R/65R/70R



44 722 A11

Service Manual

COMPACT disc DIGITAL AUDIO

Electrically: CD210/00R ≡ CD210/60R
CD210/05R ≡ CD210/65R ≡ CD210/70R ≡ CD210/10G
CD210/61R ≡ CD210/60R with voltage selector

CONTENTS

1 Contents and operation buttons
2 Technical specifications
servicing hints, loading and cabinet parts
3 Electrical measurements and adjustments
4 Blockdiagram, panel data and partslist of the main panel
5 Control and display, wiring diagram and electrical partslist

(S) Varning!

Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

(DK) Advarsel!

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(SF) Varoitus!

Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilyä.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

CLASS 1 LASER PRODUCT

3122 110 03420

Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Servicio

PHILIPS

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrees, seuls habilités à réparer votre appareil en panne".

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Printed in The Netherlands

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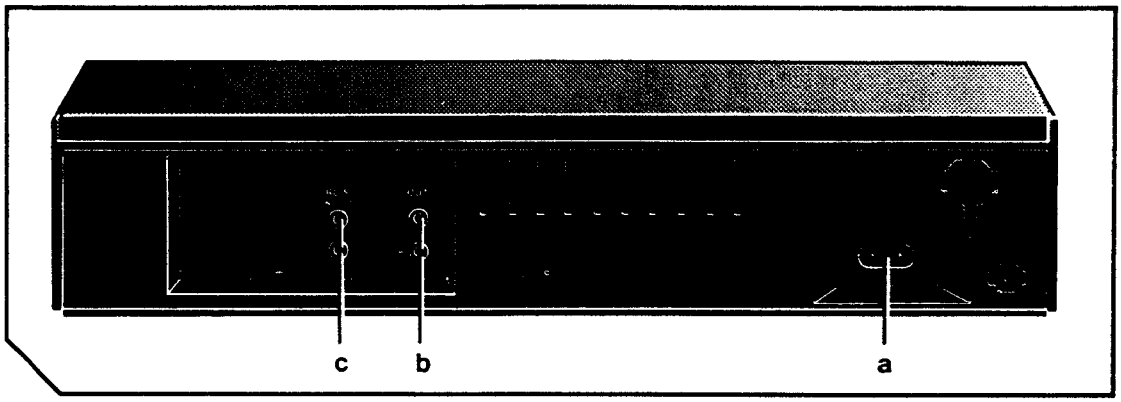
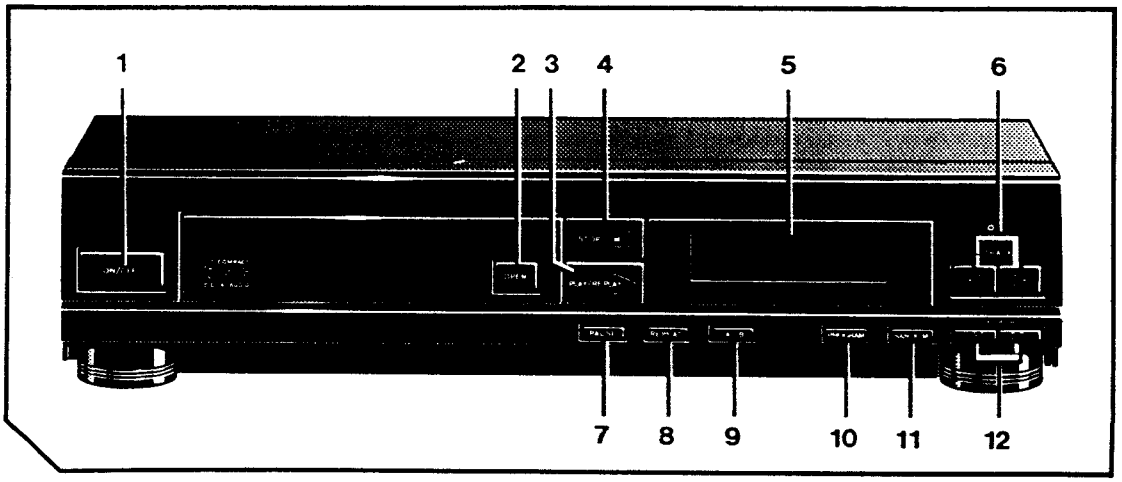
PHILIPS

Published by Service Consumer Electronics





44 723 A11

OPERATION

1 ON/OFF
2 OPEN
3 PLAY/REPLAY
4 STOP/CM
5 DISPLAY
6 ⏮ TRACK ⏭
7 PAUSE
8 REPEAT
9 A/B
10 PROGRAM
11 RANDOM
12 ⏪SEARCH⏩

a CONNECTIONS FOR THE MAINSLEAD
b OUT LEFT/RIGHT
c RC5 IN/OUT

TECHNICAL DATA

Typical Audio Performance

- Number of Channels: 2
- Frequency Range: 2-20 000 Hz
- Output resistance: 1 KΩ
- Nominal load impedance: 100 kΩ//100 pF
- Amplitude Linearity: ± 1 dB max. (20-20 000 Hz)
- Phase Linearity: ± 1.0° (20-20 000 Hz)
- Dynamic Range: 65 dB min. (20-20 000 Hz)
- Signal-to-Noise Ratio: 75 dB min. (20-20 000 Hz)
- Channel Separation: 60 dB (20-20 000 Hz)
- Total Harmonic Distortion: 65 dB/0.05% (20-20 000 Hz)
- Wow and Flutter: quartz crystal precision
- D/A Conversion: quadruple oversampling (176.4 kHz) with digital filter and two 16 bit D/A converters
- Error Correction System: Cross Interleaved Reed Solomon Code (CIRC)
- Audio Output Level: 2 $V_{rms.}$

Power Supply

- Mains Voltage: see type plate at rear of player
- Mains Frequencies: 50 and 60 Hz
- Power Consumption: 15 W approx.
- Safety Requirements: IEC

Cabinet, general

- Dimensions (wxhxd)
  cabinet with tray closed: 360 x 80/86 x 300 mm approx.
  cabinet with tray opened: 360 x 80/86 x 445 mm approx.

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

SERVICING HINTS

In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

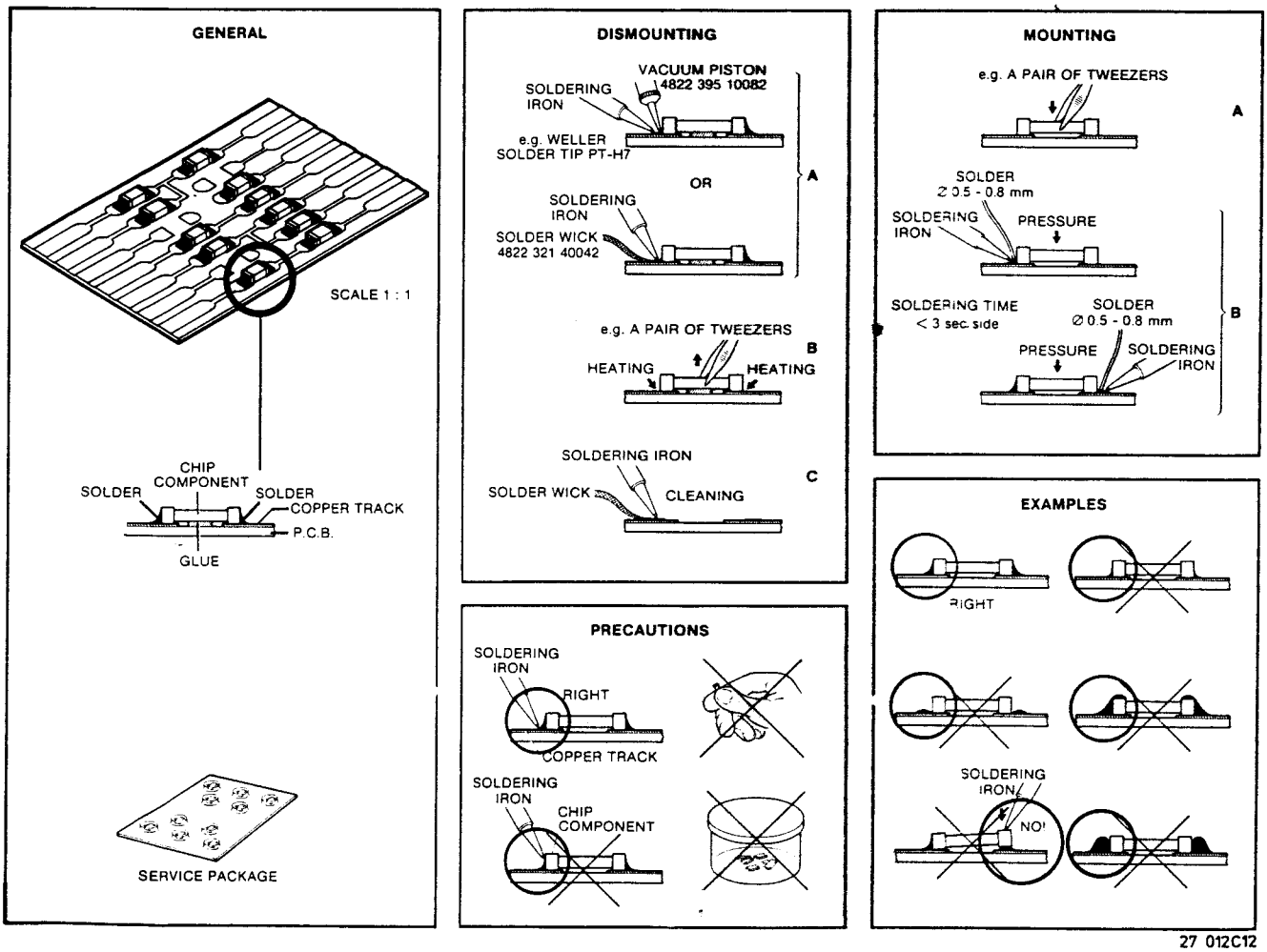
The disc should always rest properly on the turntable. To achieve this a disc hold–down has been mounted in a bracket of the tray mechanism.
If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used. For a service disc hold–down see drawing 42565 A12.
Page 2-3

Test discs

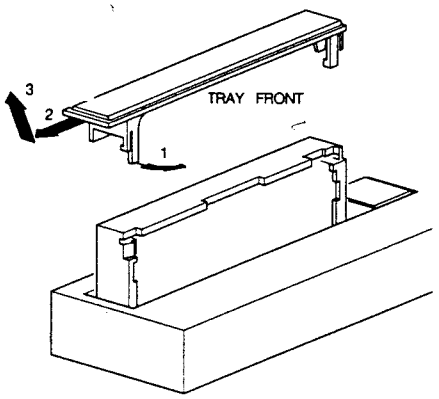
It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

SERVICE TOOLS

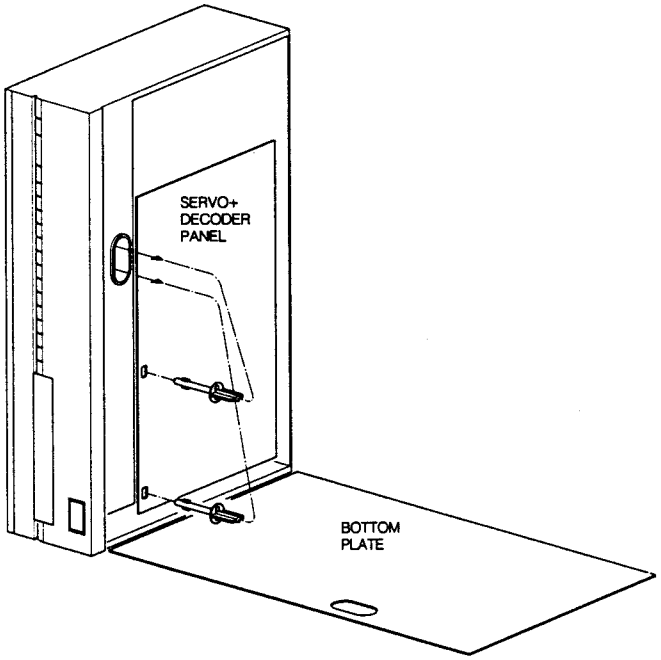
Audio signal disc (1)	4822 397 30184
Disc without errors (5)+ disc with DO errors, black spots and fingerprints (5A)	4822 397 30096
Disc 65 min 1kHz without pause	4822 397 30155
Max diameter disc	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (5p)	4822 321 21273
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Glass disc	4822 395 90204



27 012C12

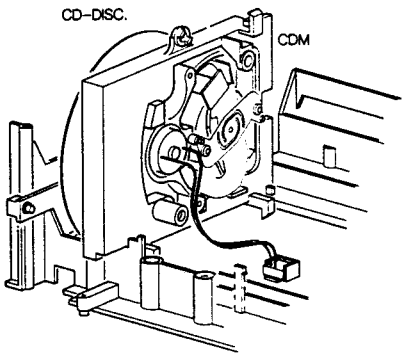


MEASURING AND ADJUSTMENT POSITION OF THE SET



MDA.02138
916/T19

SERVICE POSITION PLAY



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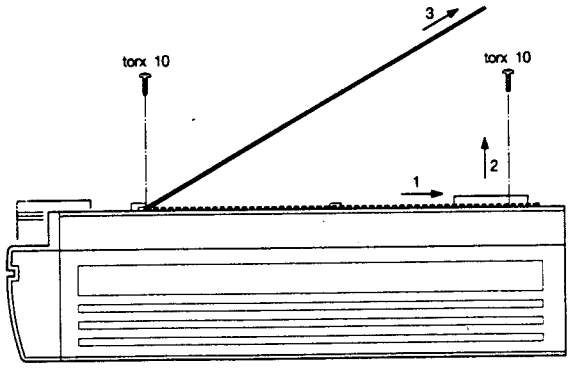
916/T19

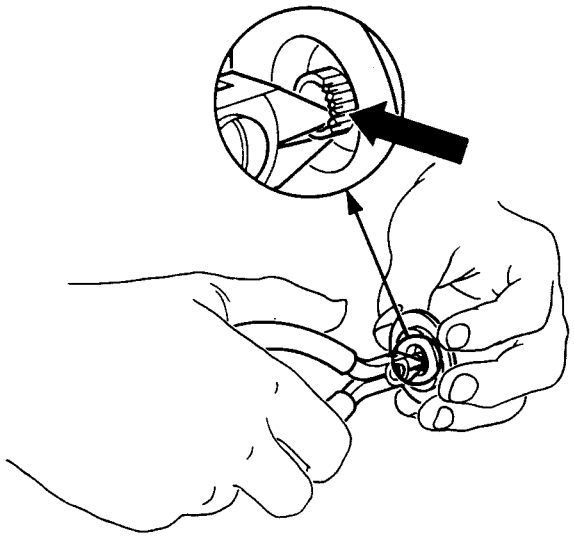
(DE)-MOUNTING THE BOTTOM PLATE

1 3
2 2
3 1



MDA.02161
T20-916

SERVICE DISC-HOLDDOWN

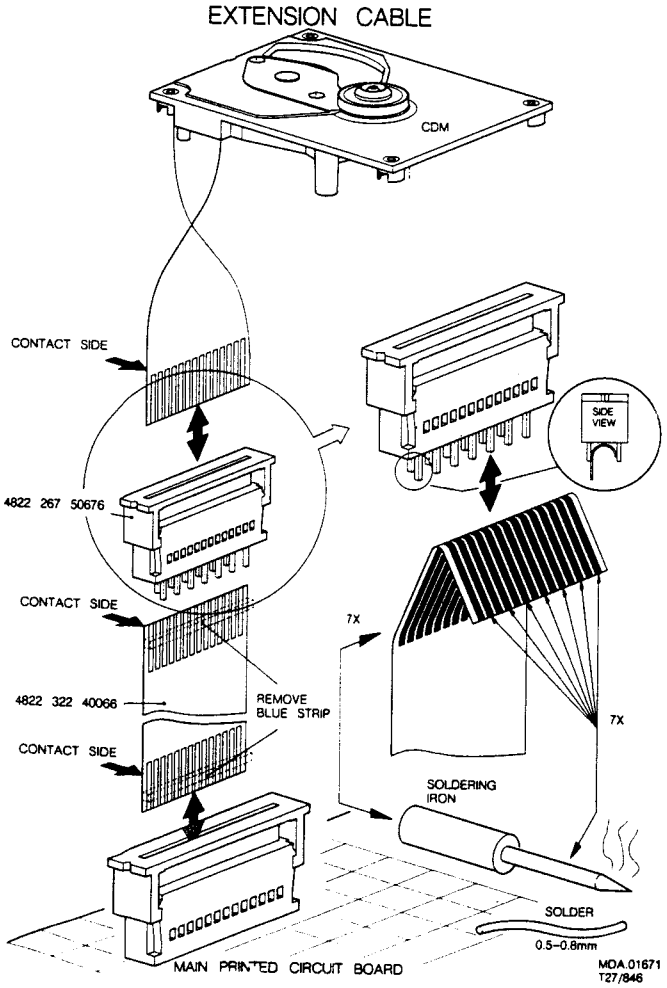


42 565 A12

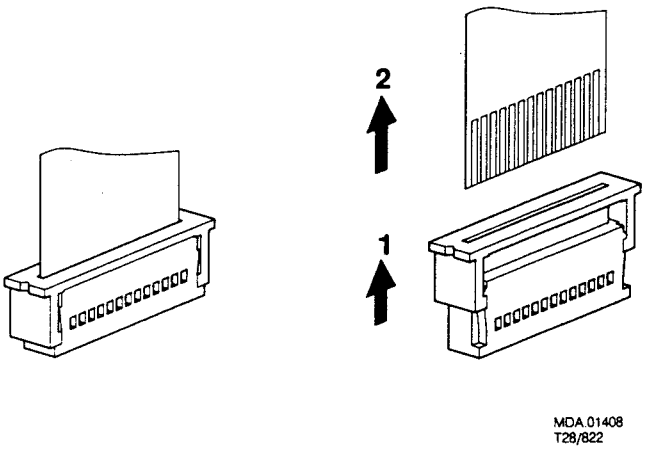
Compose a service Disc hold-down in the following way

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

SERVICE CDM FOIL



DEMOUNTING FOIL CDM



CABINET PARTS

201	4822 492 52094	
202	4822 532 51756	
203	4822 402 61252	
204	4822 444 50603	
206	4822 325 50176	
207	4822 325 50177	
208	4822 466 92251	(+ pos. 206, 207, 227)
209	4822 459 10806	
211	4822 410 60107	/00R/05R
211	4822 410 60438	/60R/65R/70R
212	4822 444 40306	/00R/05R
212	4822 444 40337	/60R/65R/70R
213	4822 381 11053	/00R/05R
213	4822 450 61479	/60R/65R/70R
214	4822 410 60106	/00R/05R
214	4822 410 60437	/60R/65R/70R
216	4822 444 40307	/00R/05R
216	4822 444 40338	/60R/65R/70R
217	4822 321 10457	/00R/60R
217	4822 321 10522	/05R/65R
217	4822 321 10523	/10G/70R
218	4822 321 22832	
219	4822 402 61253	
221	4822 444 60568	
222	4822 466 92257	
223	4822 401 61207	
224	4822 520 40177	
226	4822 530 80503	
227	4822 528 90638	
228	4822 492 51902	
229	4822 466 61587	
230	4822 358 10115	
231	4822 528 81329	
232	4822 402 50276	
233	4822 492 52123	
234	4822 256 30274	
235	4822 535 71262	
236	4822 492 32883	
237	4822 528 90639	
238	4822 691 30209	
239	4822 402 61196	
241	4822 361 20998	
242	4822 492 63076	

Spring under item 231 4822 492 70332

CHANGES

Changed pages
Introductions with A89-119

Page	Reason
Frontpage	/60R/65R and /70R added
2-1-a	Max. diameter added
2-3-a	Partslist adapted for /60R, /65R and /70R
4-2-a	Drawing corrected
	Table adapted for /60R, /65R and /70R
4-3-a	Mapping added
4-6-a	Mapping added
5-1-a	Circuit diagram corrected
	Correct printed circuit board given

CHANGES

Changed pages
Introductions with A89-121

Page	Reason
Frontpage	/61R added
2-3b	Partslist adapted
4-1-1	Wiring diagram added
4-4a	Due to change of main panel
4-5a	Due to change of main panel
4-5-1	Due to change of main panel
4-5-2	Due to change of main panel
4-6b	Schematic diagram adapted
5-2a	Partslist adapted

CHANGES
Changed pages
Introductions with A90-110

Page	Reason
1-1c	/10G added
2-3c	/10G added
6-2	changes

XA 711

Signal 3

Service Information

	1989-11-06
	CD210
	A89-121

(GB)

To adapt the Service Manual the following sheets have been changed/added.

(NL)

Voor het aanpassen van de Service Manual zijn onderstaande pagina's gewijzigd/toegevoegd.

(F)

Afin de pouvoir adapter le Manual Service les feuillets suivants ont été soit modifiés, soit ajoutés.

(D)

Zur Anpassung des Service Manual sind nachstehende Seiten geändert/hinzugefüght.

(I)

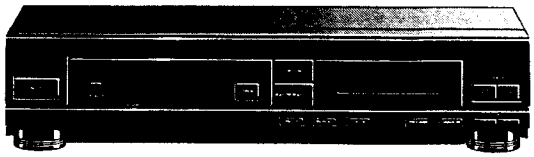
Allo scope di adattare il manuale di Servizio sono state variate/aggiunte le sequenti pagine.

1-1b ; 2-1a
2-2 ; 2-3b
4-1-1
4-4a ; 4-5a
4-5-1 ; 4-5-2
4-6b ; 5-1a
5-2a ; 5-3
6-1a

Compact disc player CD210

Service
Service
Service

00R/05R/60R/61R/65R/70R



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Service Manual

COMPACT disc DIGITAL AUDIO

Electrically: CD210/00R ≡ CD210/60R
CD210/05R ≡ CD210/65R ≡ CD210/70R
CD210/61R = CD210/60R with voltage selector

CONTENTS

1 Contents and operation buttons
2 Technical specifications
servicing hints, loading and cabinet parts
3 Electrical measurements and adjustments
4 Blockdiagram, panel data and partslist of the main panel
5 Control and display, wiring diagram and electrical partslist
6 Changes

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(D)
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CLASS 1
LASER PRODUCT
3122 110 03420

Documentation Technique Service Dokumentation Documentazione di Servizio Huolto-Ohje Manual de Servicio Manual de Servicio

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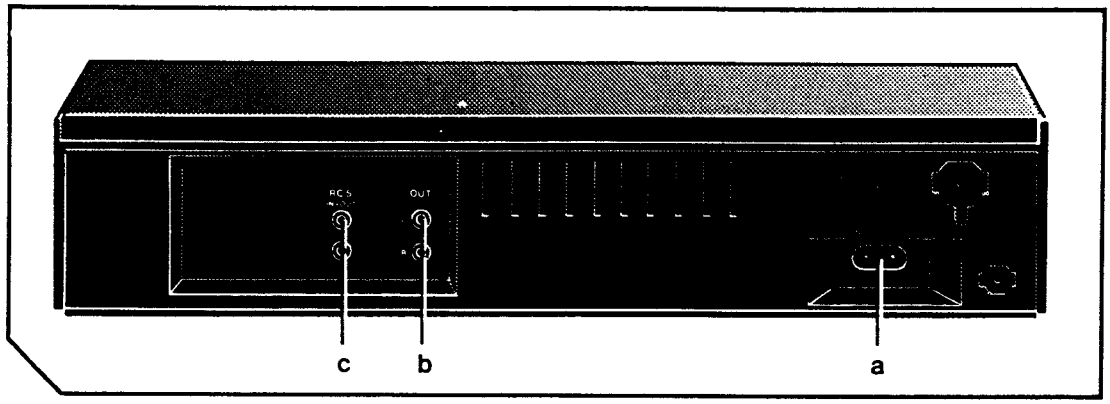

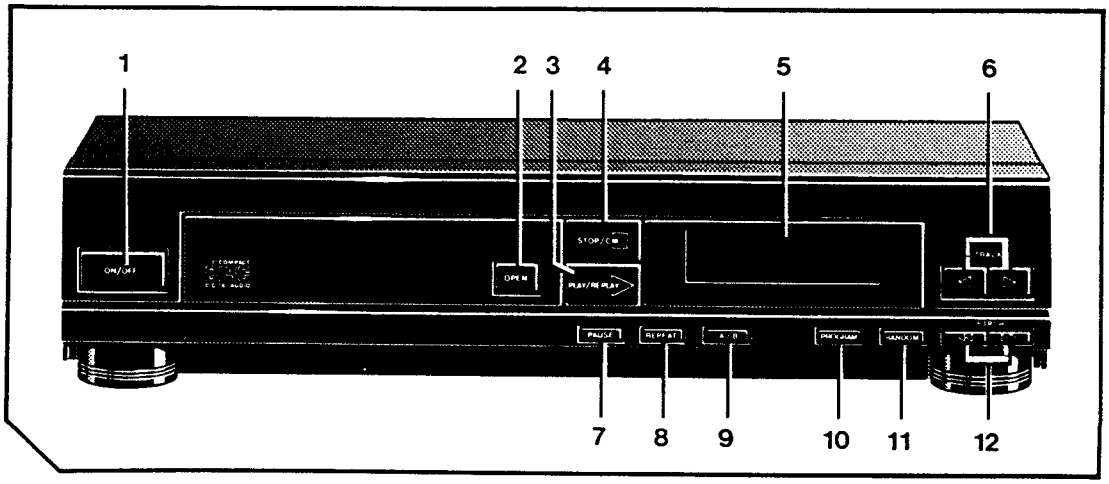

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OPERATION

1 ON/OFF
2 OPEN
3 PLAY/REPLAY
4 STOP/CM
5 DISPLAY
6 ⏮ TRACK ⏭
7 PAUSE
8 REPEAT
9 A/B
10 PROGRAM
11 RANDOM
12 ⏪SEARCH⏩

a CONNECTIONS FOR THE MAINSLEAD
b OUT LEFT/RIGHT
c RC5 IN/OUT

TECHNICAL DATA

Typical Audio Performance

- Number of Channels: 2
- Frequency Range: 2-20 000 Hz
- Output resistance: 1 KΩ
- Nominal load impedance: 100 kΩ//100 pF
- Amplitude Linearity: ± 1 dB max. (20-20 000 Hz)
- Phase Linearity: ± 1.0° (20-20 000 Hz)
- Dynamic Range: 65 dB min. (20-20 000 Hz)
- Signal-to-Noise Ratio: 75 dB min. (20-20 000 Hz)
- Channel Separation: 60 dB (20-20 000 Hz)
- Total Harmonic Distortion: 65 dB/0.05% (20-20 000 Hz)
- Wow and Flutter: quartz crystal precision
- D/A Conversion: quadruple oversampling (176.4 kHz) with digital filter and two 16 bit D/A converters
- Error Correction System: Cross Interleaved Reed Solomon Code (CIRC)
- Audio Output Level: 2 $V_{rms.}$

Power Supply

- Mains Voltage: see type plate at rear of player
- Mains Frequencies: 50 and 60 Hz
- Power Consumption: 15 W approx.
- Safety Requirements: IEC

Cabinet, general

- Dimensions (wxhxd)
  cabinet with tray closed: 360 x 80/86 x 300 mm approx.
  cabinet with tray opened: 360 x 80/86 x 445 mm approx.

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

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Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

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Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

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Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

SERVICING HINTS

In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

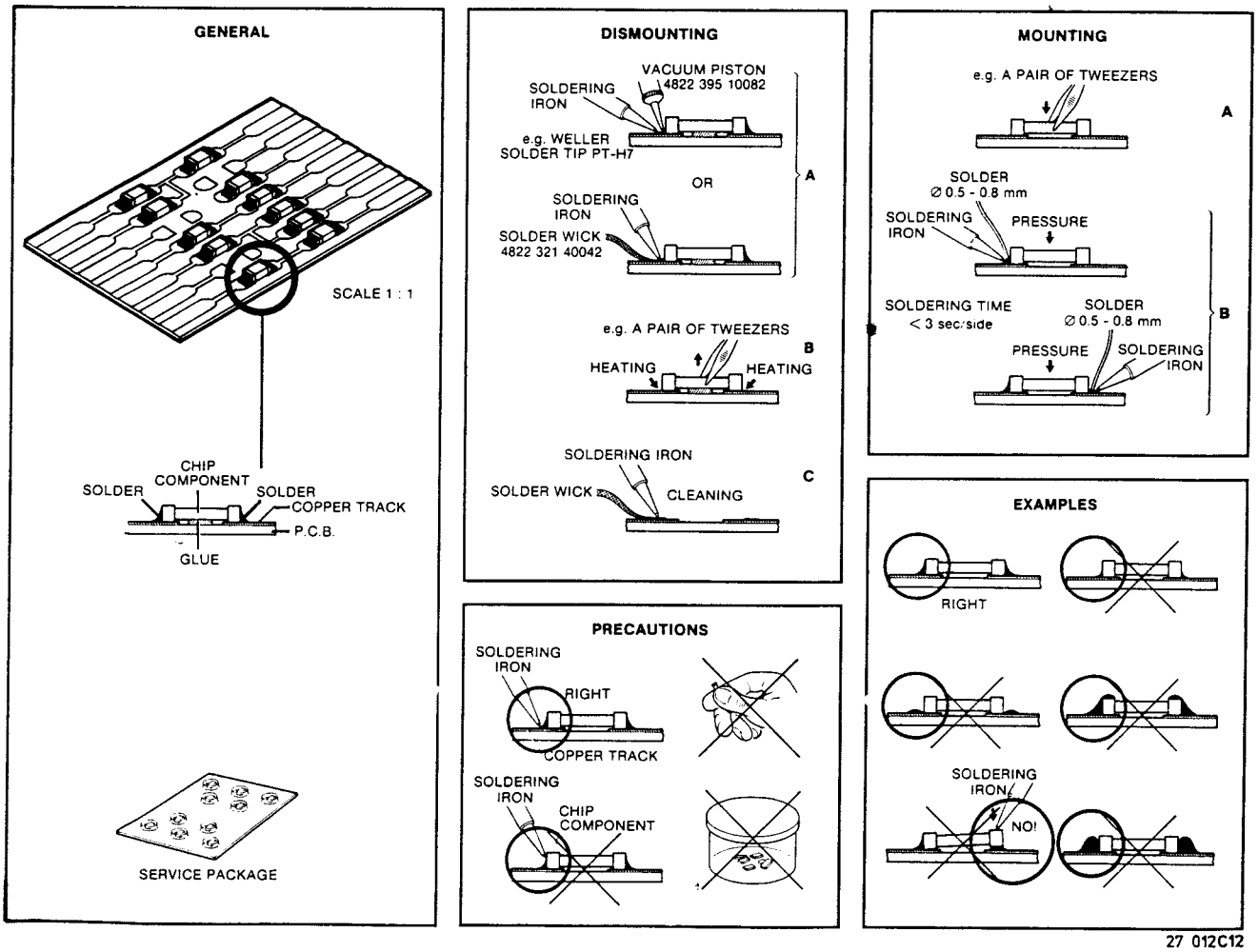
The disc should always rest properly on the turntable. To achieve this a disc hold–down has been mounted in a bracket of the tray mechanism.
If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used. For a service disc hold–down see drawing 42565 A12.
Page 2-3

Test discs

It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

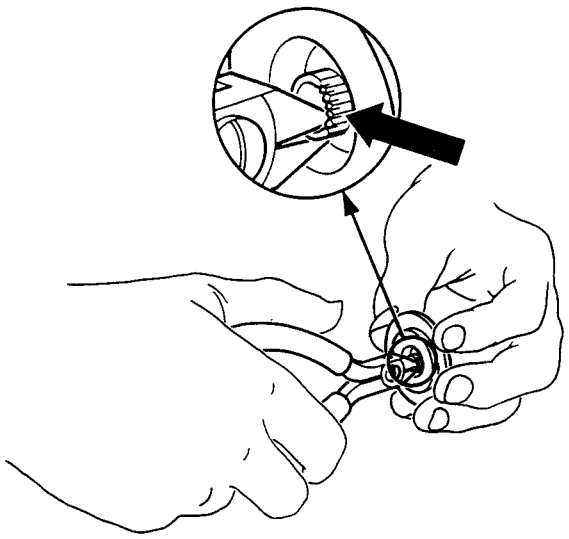
SERVICE TOOLS

Audio signal disc (1)	4822 397 30184
Disc without errors (5)+ disc with DO errors, black spots and fingerprints (5A)	4822 397 30096
Disc 65 min 1kHz without pause	4822 397 30155
Max diameter disc	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (5p)	4822 321 21273
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Glass disc	4822 395 90204



27 012C12

SERVICE DISC-HOLDDOWN

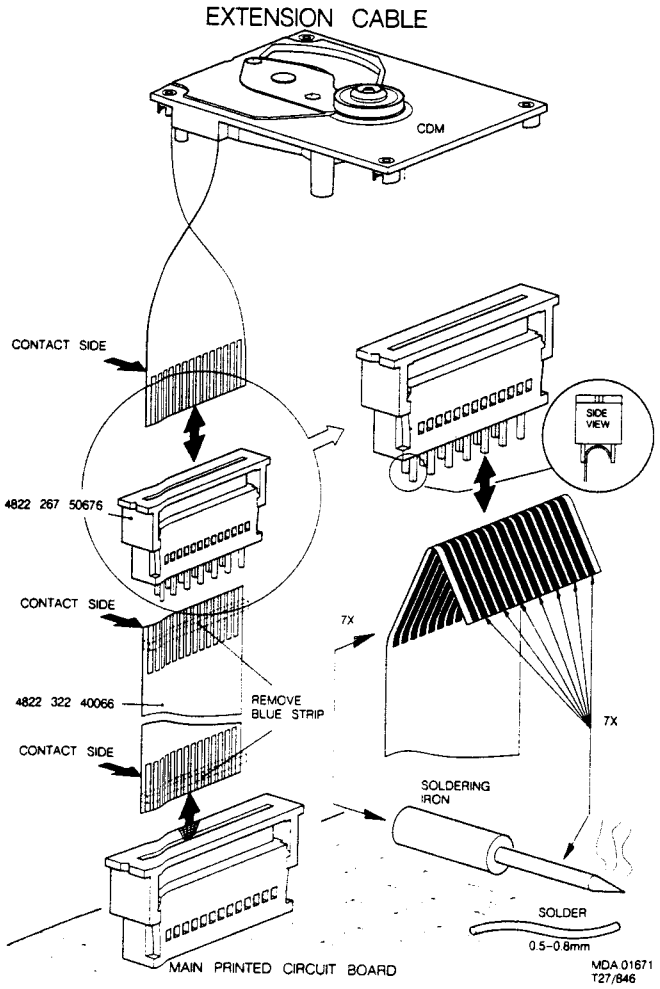


42 565 A12

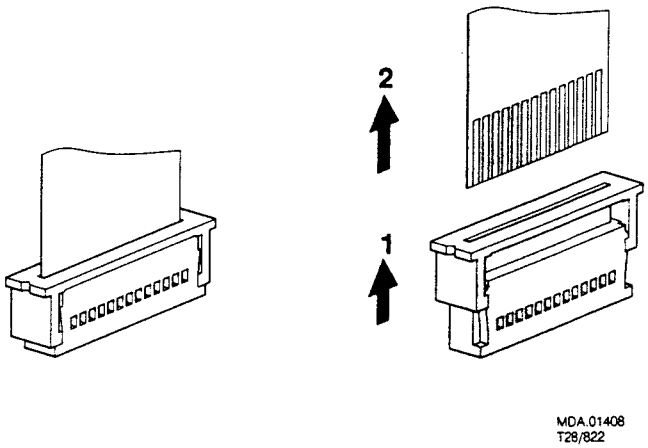
Compose a service Disc hold-down in the following way

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

SERVICE CDM FOIL



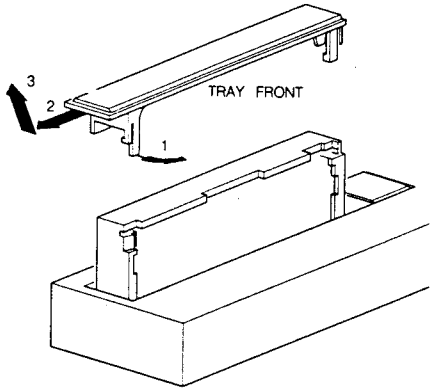
DEMOUNTING FOIL CDM



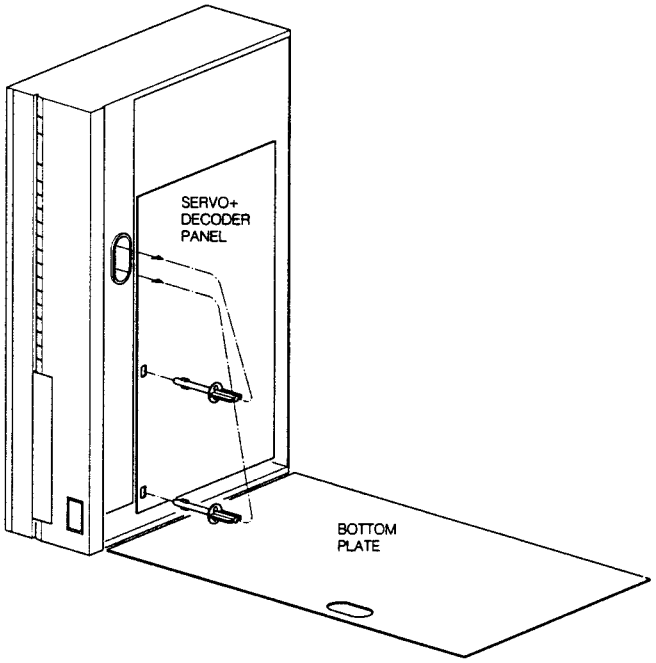
CABINET PARTS

201	4822 492 52094	
202	4822 532 51756	
203	4822 402 61252	
204	4822 444 50603	
206	4822 325 50176	
207	4822 325 50177	
208	4822 466 92251	(+ pos. 206, 207, 227)
209	4822 459 10806	
211	4822 410 60107	/00R/05R
211	4822 410 60438	/60R/65R/70R
212	4822 444 40306	/00R/05R
212	4822 444 40337	/60R/65R/70R
213	4822 381 11053	/00R/05R
213	4822 450 61479	/60R/65R/70R
214	4822 410 60106	/00R/05R
214	4822 410 60437	/60R/65R/70R
216	4822 444 40307	/00R/05R
216	4822 444 40338	/60R/65R/70R
217	4822 321 10457	/00R/60R
217	4822 321 10522	/05R/65R
217	4822 321 10523	/70R
218	4822 321 22832	
219	4822 402 61253	
221	4822 444 60568	
222	4822 466 92257	
223	4822 401 61207	
224	4822 520 40177	
226	4822 530 80503	
227	4822 528 90638	
228	4822 492 51902	
229	4822 466 61587	
230	4822 358 10115	
231	4822 528 81329	
232	4822 402 50276	
233	4822 492 52123	
234	4822 256 30274	
235	4822 535 71262	
236	4822 492 32883	
237	4822 528 90639	
238	4822 691 30209	
239	4822 402 61196	
241	4822 361 20998	
242	4822 492 63076	

Spring under item 231 4822 492 70332

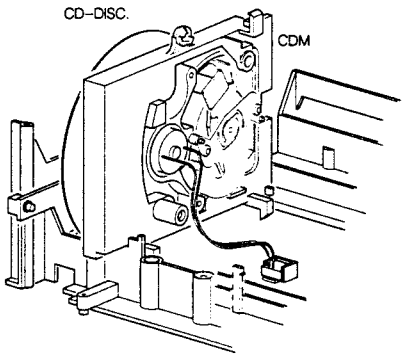


MEASURING AND ADJUSTMENT POSITION OF THE SET



MDA.02138
916/T19

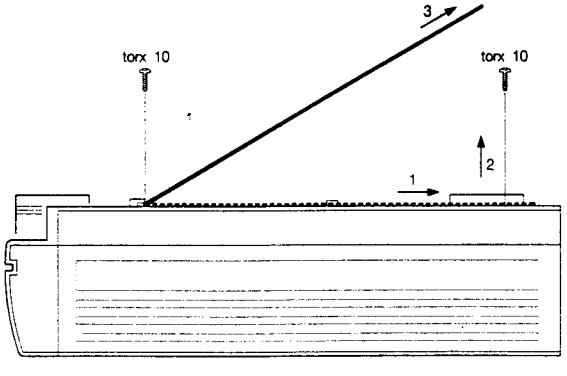
SERVICE POSITION PLAY



EVA.00849
916/T19

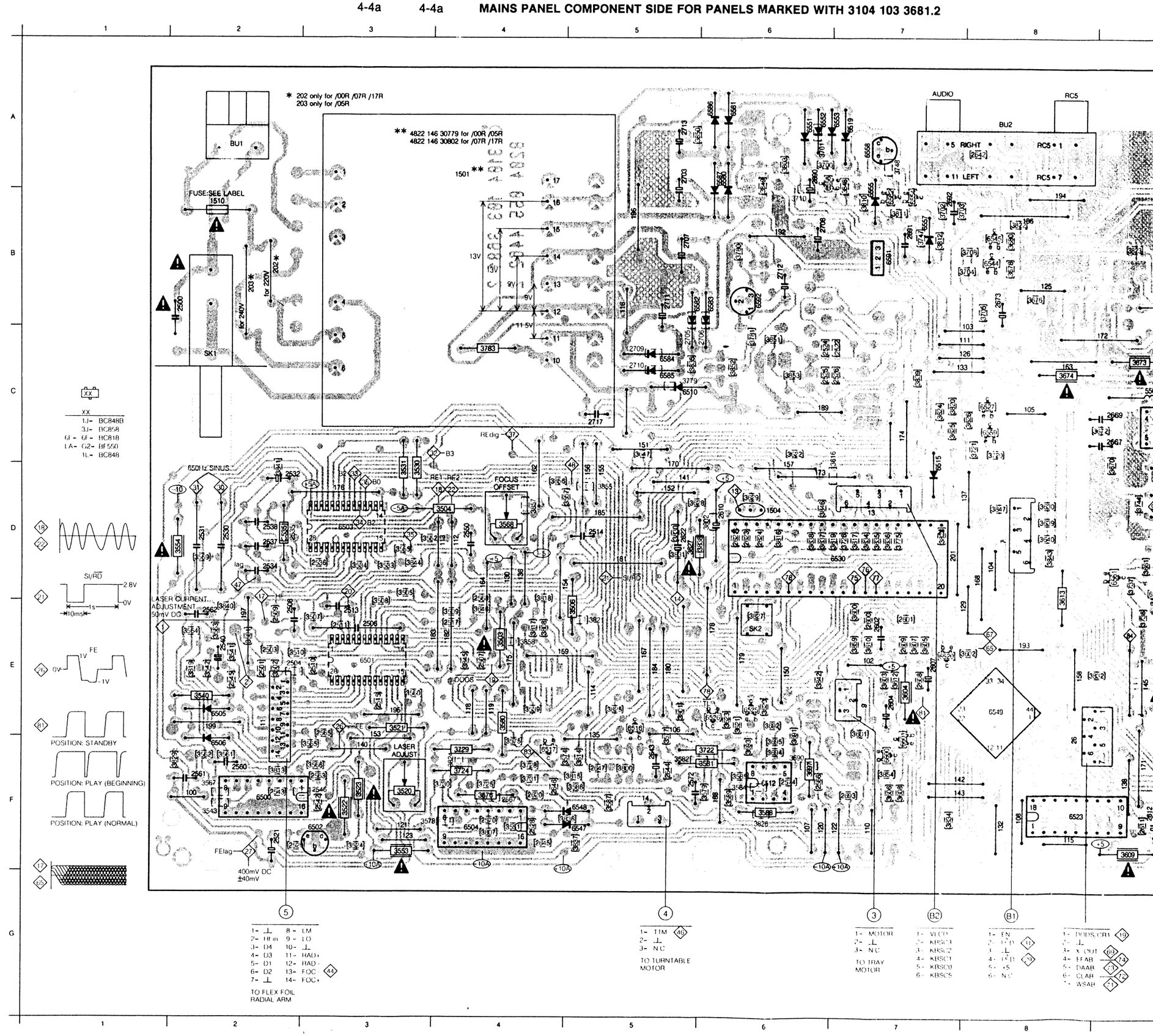
(DE)-MOUNTING THE BOTTOM PLATE

1 3
2 2
3 1



MDA.02151
720-918

MAINS PANEL COMPONENT SIDE FOR PANELS MARKED WITH 3104 103 3681.2



XX
1J= BC848B
3J= BC858
6F= 6F= BC818
LA= G2= BF550
1L= BC848

(5)
1= ⊥ 8= LM
2= HFm 9= LO
3= D4 10= ⊥
4= D3 11= RAD+
5= D1 12= RAD-
6= D2 13= FOC
7= ⊥ 14= FOC+

(4)
1= TTM
2= ⊥
3= N.C

(3)
1= MOTOR
2= ⊥
3= N.C

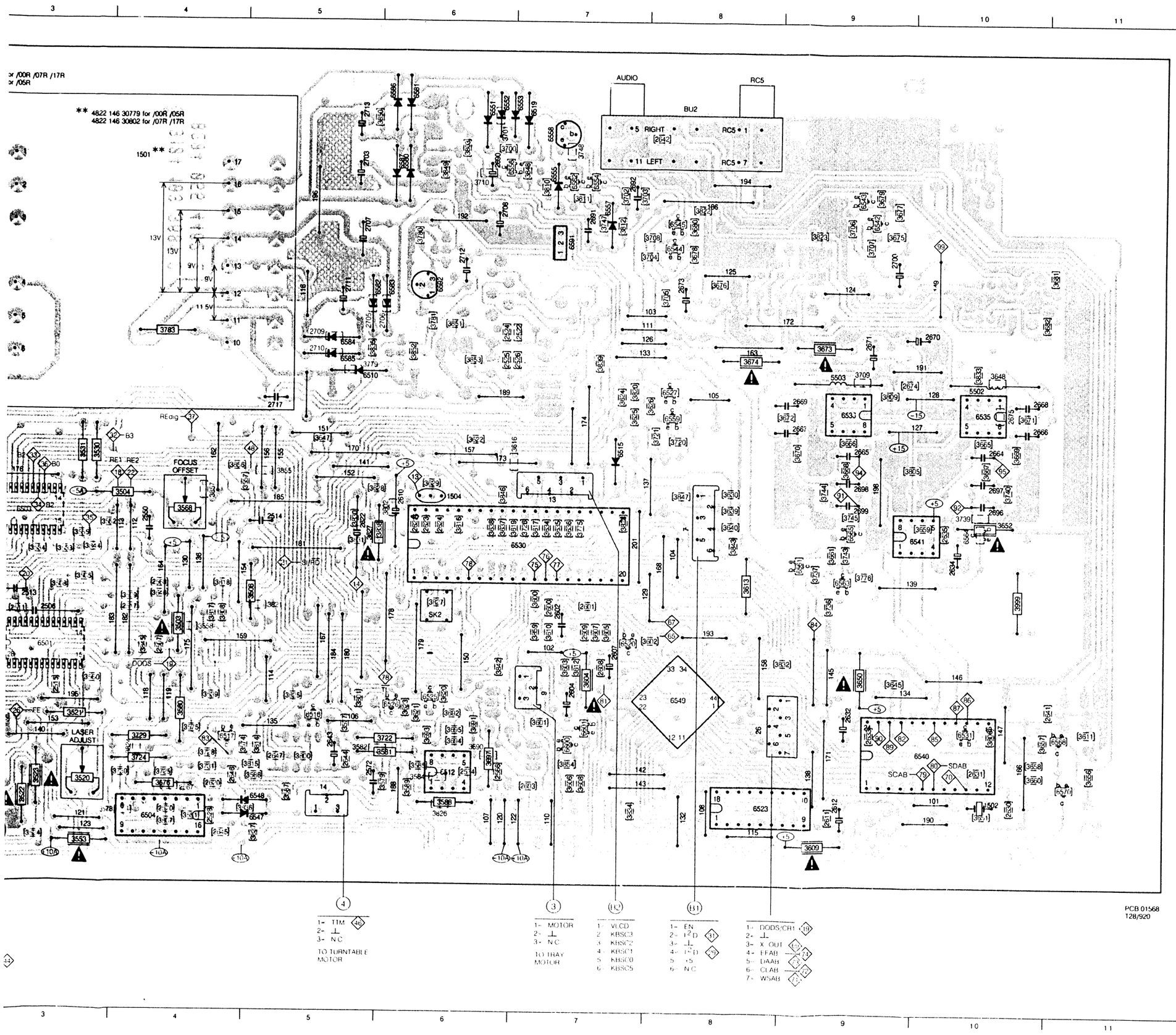
(B2)
1= VLCD
2= KBSC3
3= KBSC2
4= KBSC1
5= KBSC0
6= KBSC5

(B1)
1= EN
2= LCD
3= ⊥
4= LCD
5= +5
6= N.C

1= DODS/CR1
2= ⊥
3= X OUT
4= EFAB
5= DAAB
6= CLAB
7= WSAB

Sept 3

MAINS PANEL COMPONENT SIDE FOR PANELS MARKED WITH 3104 103 3681.2



100	F 2	2531	D 2	3567	F 2	3779	C 5	6592	B 6
101	F10	2532	D 2	3568	D 4	3780	B 6	6600	F 7
102	E 7	2534	D 2	3569	D 2	3781	C 6	6601	F 7
103	B 8	2535	D 2	3574	F 4	3783	C 4	7	D 8
104	D 8	2536	D 3	3575	F 4	3800	F 5	9	E 7
105	C 8	2537	D 2	3576	F 4	3801	E 5	BU1	E A 2
106	E 5	2538	D 2	3577	E 5	3802	D 6	BU2	A 8
107	F 6	2540	E 2	3578	F 3	3803	A 6	SK1	C 2
108	F 8	2542	F 3	3579	F 6	3805	D10	SK2	E 6
110	F 7	2543	F 2	3580	E 4	3806	F10		
111	C 7	2545	E 2	3581	F 6	3807	F 4		
112	D 4	2546	F 3	3582	F 5	3808	E 4		
113	D 4	2550	D 4	3584	F 6	3809	C 9		
114	E 5	2560	F 2	3585	F 6	3810	B 7		
115	F 8	2561	F 2	3586	F 5	3811	B 7		
116	B 5	2562	E 2	3587	F 5	3812	B 7		
118	E 4	2563	F 3	3588	F 6	3813	F 2		
119	E 4	2565	E 3	3589	F 6	3814	F 5		
120	F 6	2566	F 6	3600	E 7	3815	F 5		
121	F 3	2567	F 4	3601	E 7	3816	D 6		
122	F 7	2568	D 4	3602	E 8	3817	D E 4		
123	F 3	2570	F 4	3603	E 7	3818	D E 4		
124	B 9	2572	F 5	3604	E 7	3819	E 2		
125	B 8	2574	F 6	3605	E 7	3820	C 7		
126	C 7	26	E 8	3606	F 7	3821	E 5		
127	C10	2600	E 7	3607	E 7	3822	B 8		
128	C10	2601	E 7	3608	F 7	3823	B 9		
129	E 7	2602	E 7	3609	F 9	3824	F 4		
130	D 4	2604	E 7	3610	E 7	3825	E 5		
132	F 8	2607	E 7	3611	F11	3826	F 6		
133	C 7	2608	E 7	3612	E 7	3827	E 6		
134	E 9	2609	E 7	3613	D 8	3828	D 7		
135	E 5	2610	D 6	3616	C 7	3829	D 2		
136	D 4	2611	F 9	3617	D 7	3830	D 5		
137	D 7	2612	F 9	3619	D 7	3831	D E 5		
138	F 9	2620	F 4	3620	E 6	3832	D E 9		
139	D 9	2621	D 6	3621	E 6	3833	C10		
140	F 3	2622	D 5	3622	C 6	3834	F 7		
141	D 5	2623	D 6	3623	E 6	3835	C 5		
142	F 7	2624	D 6	3624	C 7	3836	F 5		
143	F 7	2630	F10	3625	C 7	3837	F 5		
145	E 9	2631	F10	3626	C 8	3838	D 6		
146	E10	2632	E 9	3627	D 5	3839	D 7		
147	F10	2633	F 9	3628	D 6	3840	E 2		
149	B10	2634	D10	3629	D 6	3841	E D 2		
150	E 6	2635	D10	3630	D 8	3842	E 6		
151	C 5	2641	E11	3634	D 7	3843	D 8		
152	D 5	2642	A 8	3635	D 7	3844	D 3		
153	E 3	2643	F 5	3636	D 7	3845	E 4		
154	D 4	2644	F 5	3637	D 6	3846	D 6		
155	D 5	2645	F 4	3638	D 6	3847	D 8		
156	D 5	2646	F 4	3639	D 8	3848	A 7		
157	D 6	2647	F 5	3640	D 8	3849	A 6		
158	E 8	2664	C10	3645	E 9	3850	A 5		
159	E 4	2665	C 9	3646	E 4	3851	C 6		
162	D 4	2666	C10	3647	C 5	3852	C 6		
163	C 8	2667	C 9	3648	C10	3853	C 6		
164	D 4	2668	C10	3650	E 9	3854	F 7		
166	F10	2669	C 9	3651	F10	3855	D 5		
167	E 5	2670	C10	3652	D10	3856	D 4		
168	D 8	2671	C 9	3656	F11	3857	D 4		
170	D 5	2673	B 8	3657	F10	3858	E 4		
171	F 9	2674	C 9	3658	F10	3859	E 7		
172	C 9	2675	C10	3659	D10	3999	E10		
173	D 6	2690	A 6	3660	F10	5502	C10		
174	C 7	2691	B 7	3661	D 9	5503	C 9		
175	E 4	2692	B 7	3665	C10	6500	F 2		
176	D 3	2693	F 7	3666	C 9	6501	E 3		
178	E 6	2696	D10	3667	D10	6502	F 3		
179	E 6	2697	D10	3668	D 9	6503	D 3		
180	E 5	2698	D 9	3669	C10	6504	F 4		
181	D 5	2699	D 9	3670	C 9	6505	E 2		
182	E 4	2700	B 9	3671	C10	6506	F 2		
183	E 3	2703	A 5	3672	C 9	6510	C 5		
184	E 5	2705	C 5	3673	C 9	6512	F 6		
185	D 5	2706	C 6	3674	C 8	6515	C 7		
186	B 8	2707	B 5	3675	B 9	6516	E 5		
188	F 6	2708	B 6	3676	B 8	6517	F 4		
189	C 6	2709	C 5	3677	B 9	6519	A 7		
190	F10	2710	C 5	3678	B 8	6520	E 7		
191	C10	2711	B 5	3679	B 9	6523	F 8		
192	B 6	2712	B 6	3680	B 8	6525	E 6		
193	E 8	2713	A 5	3681	B11	6526	E 6		
194	B 8	2717	C 5	3682	C10	6527	C 8		
195	E 3	3501	E 2	3690	F 6	6530	D 7		
196	B 5	3502	E 2	3691	E 6	6531	F10		
197	E 2	3503	E 2	3692	E 6	6535	C10		
198	D 9	3504	D 4	3693	F 6	6536	C 9		
199	E 2	3505	D 3	3694	F 6	6540	F10		
201	D 7	3506	E 5	3695	F 6	6541	D10		
202	B 2	3507	E 3	3697	F 6	6542	B 9		
203	B 2	3508	E 3	3700	A 6	6543	B 9		
11	E 2	3509	E 4	3701	A 6	6544	B 8		
13	D 7	3510	E 2	3702	B 7	6545	B 8		
14	F 5	3520	F 3	3703	B 7	6547	F 5		
1501	A 4	3521	F 3	3704	B 8	6548	F 5		
1502	F10	3522	F 3	3705	B 8	6549	E 8		
1504	D 6	3523	F 3	3706	B 9	6551	A 6		
1510	B 2	3524	F 3	3707	B 9	6552	A 6		
2500	B 2	3530	D 3	3708	B 8	6553	A 7		
2501	E 2	3531	D 3	3709	C 9	6554	B 7		
2503	E 2	3533	D 3	3710	B 6	6555	A 7		
2504	E 2	3534	D 3	3720	C 8	6556	A 6		
2506	E 3	3535	D 2	3721	C 8	6557	B 7		
2507	E 4	3539	E 4	3722	F 6	6558	A 7		
2508	E 2	3540	E 2	3724	F 4	6559	C 8		
2509	E 2	3541	E 2	3725	F 4	6561	D 9		
2510	E 3	3542	E 2	3726	D 7	6562	B 7		
2511	E 3	3543	F 2	3728	F 4	6563	D 9		
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2514	D 5	3552	D 3	3730	F 4	6565	D 9		
2515	E 3	3553	F 3	3731	F 4	6568	F11		
2517	E 4	3554	D 2	3736	E 9	6570	F11		
2520	F 2	3555	D 3	3737	D 9	6580	A 6		
2521	F 2	3557	D 4	3739	D10	6581	A 6		
2522	C 7	3560	E 3	3740	D10	6582	B 5		
2524	C 6	3561	F 2	3743	D 9	6583	B 6		
2525	C 6	3562	F 2	3744	D 9	6584	C 5		
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2528	F 4	3564	E 2	3747	B 7	6586	A 6		
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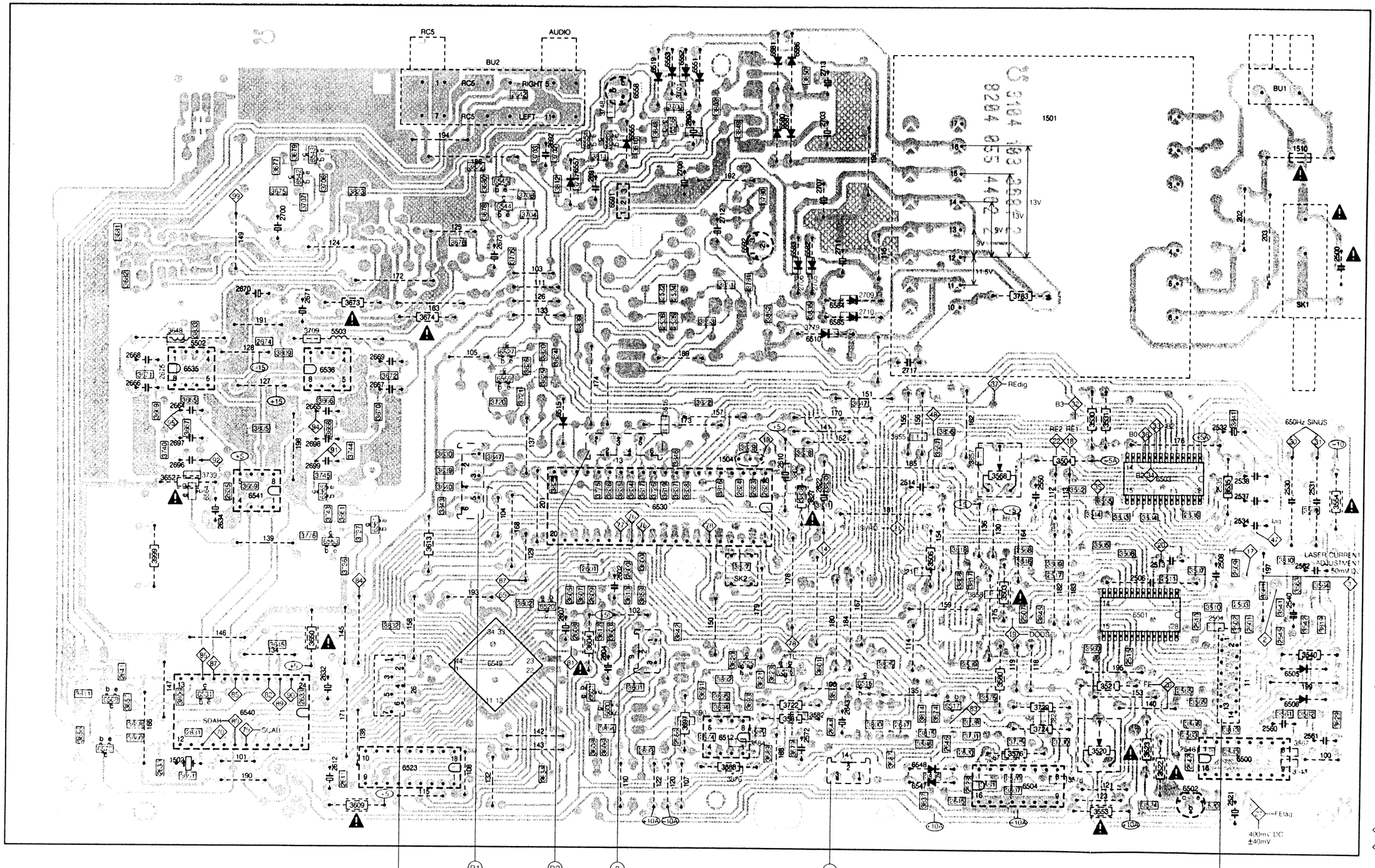
		3566	F 3	3775	D 7	6591	B 7		
				3776	D 9				



XX
1J- BC848B
3J- BC858
6E- 6F- BC818
LA- G2- BF550
1L- BC848

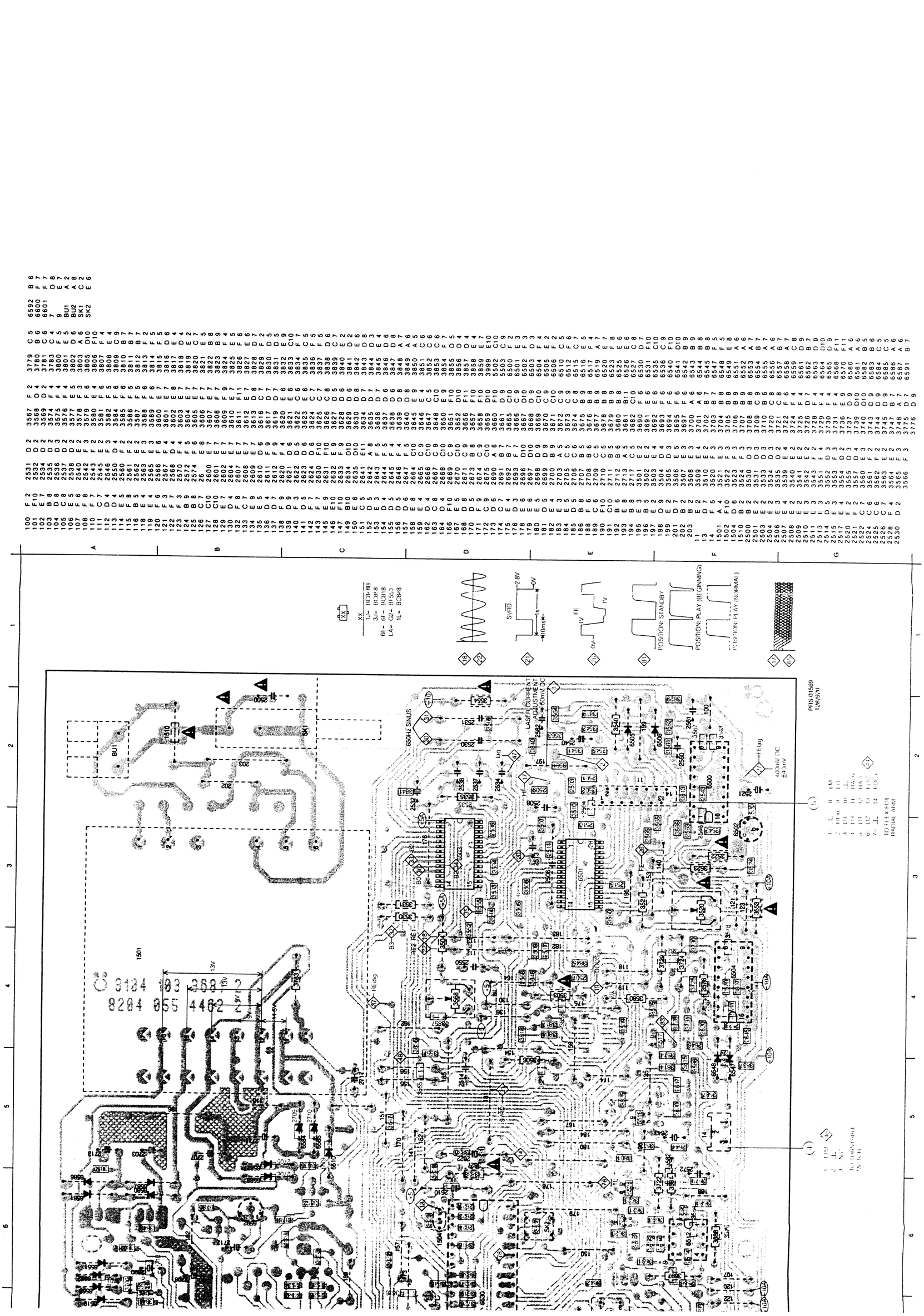
(B1)
1- EN
2- I²D
3- ⊥
4- I²D
5- +5
6- N.C

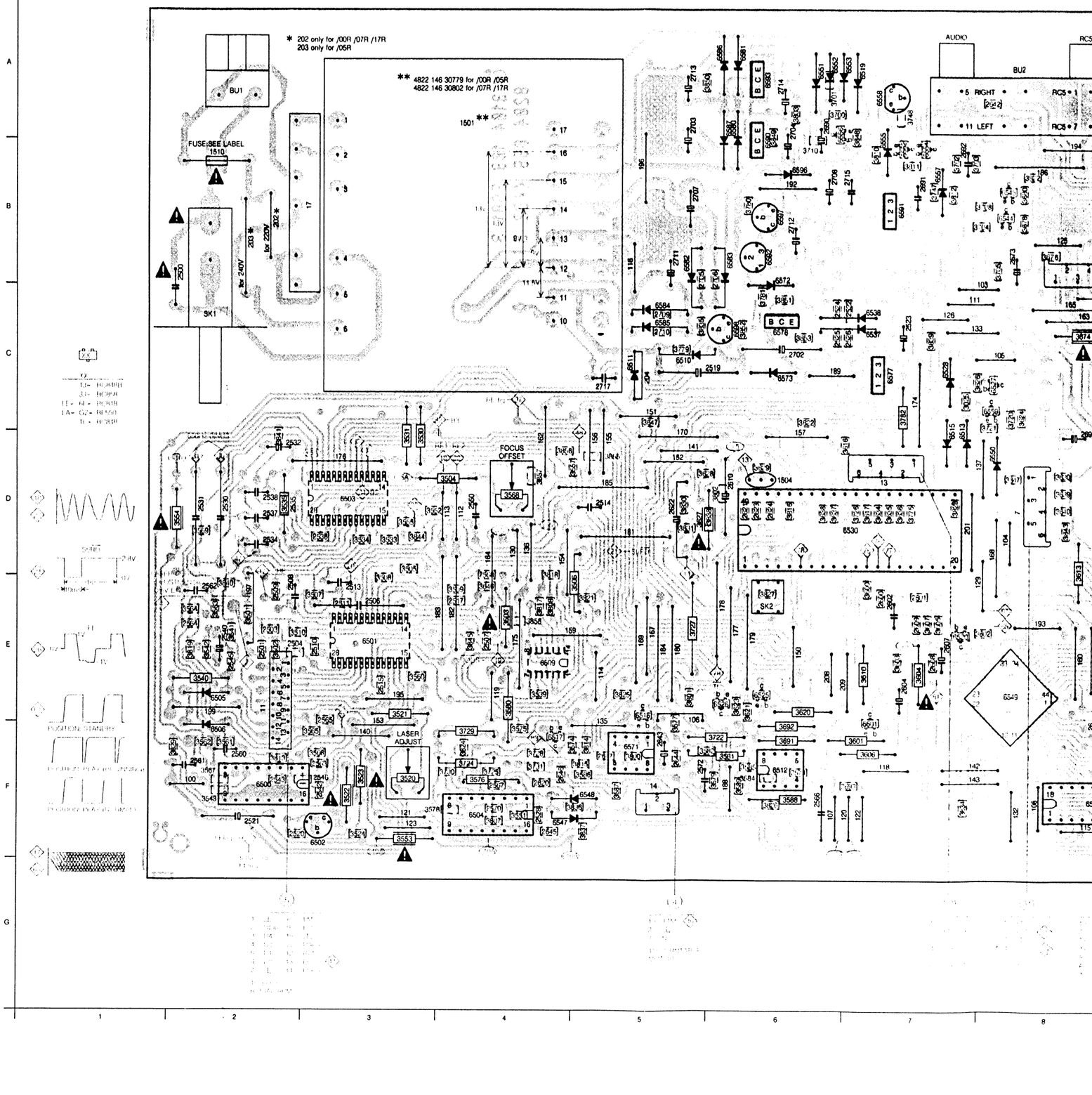
(B2)
1- VLCD
2- KBSC3
3- KBSC2
4- KBSC1
5- KBSC0
6- KBSC5

(3)
1- MOTOR
2- ⊥
3- N.C
TO TRAY MOTOR

(4)
1- TTM
2- ⊥
3- N.C
TO TURNTABLE MOTOR

(5)
1- ⊥
2- HFin
3- D4
4- D3
5- D1
6- D2
7- ⊥
8- LM
9- LO
10- ⊥
11- RAD-
12- RAD
13- FOC-
14- FOC+
TO FLEX FOIL RADIAL ARM


XX
LJ= BC848
3J= BC848
6E= BF substitute
LA= G2= BF550
1L= BC848
SI/RD
2.8V
0V
10ms
1s
FE
1V
0V
POSITION: STANDBY
POSITION: PLAY (BEGINNING)
POSITION: PLAY (NORMAL)
650Hz SINUS
LASER CURRENT ADJUSTMENT 50mV DC
400mV DC ±40mV
PHS 01560 12/8/20
TO FLEX FOR RADIAL ARM
BU1
SK1
SK2
13V
9V
8V
8204 055 44482


* 202 only for /00R /07R /17R
203 only for /05R
** 4822 146 30779 for /00R /05R
4822 146 30802 for /07R /17R
BU1
FUSE SEE LABEL
1510
SK1
1501 **
AUDIO
BU2
5 RIGHT
11 LEFT
RC5 1
RC5 7
FOCUS OFFSET
LASER ADJUST
SK2
6530
6609
6549
6502
6504
6506
6501
6503
6505
6506
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2715
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2717
FOCUS
SPIN
POSITION STARTER
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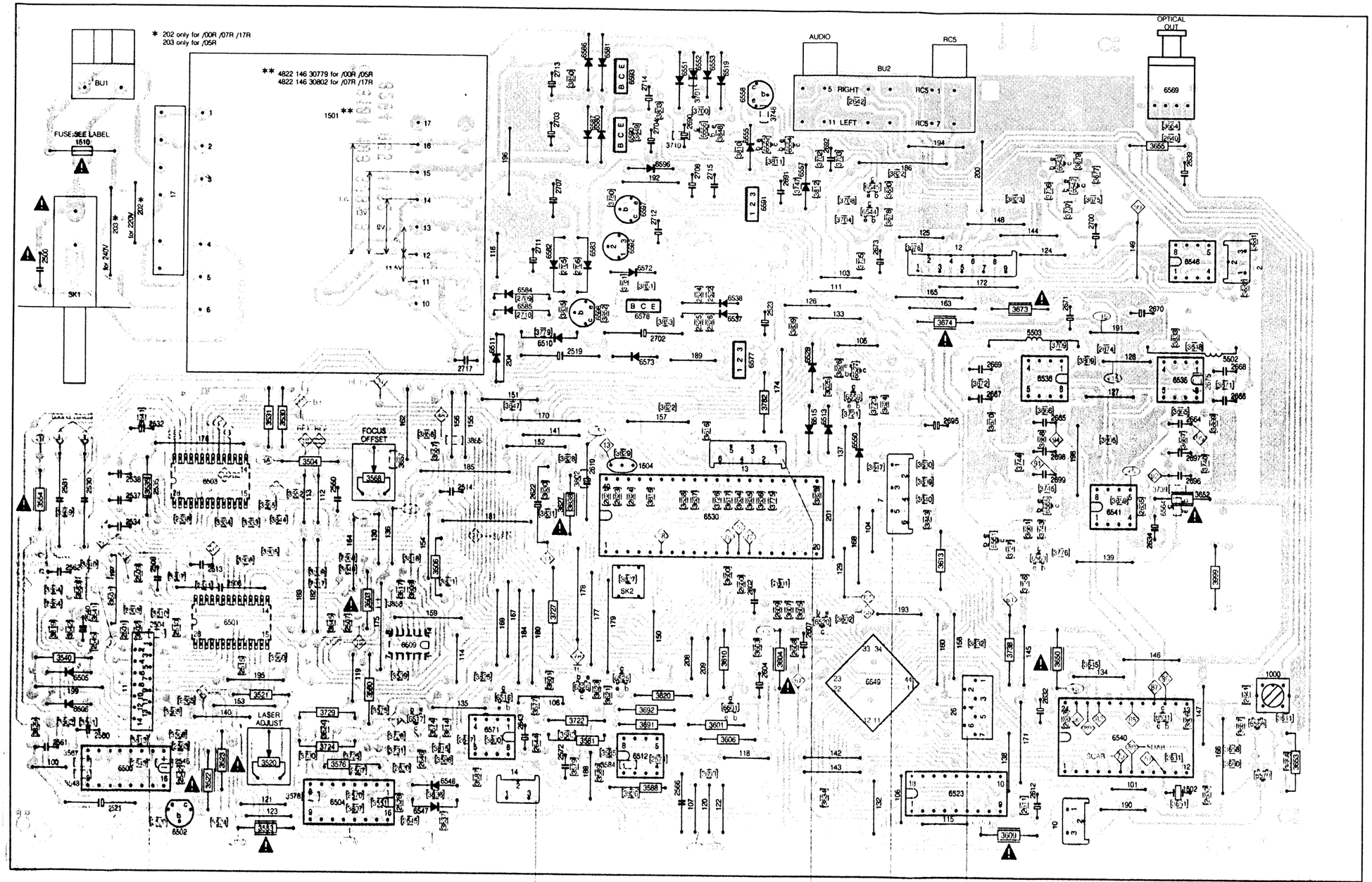

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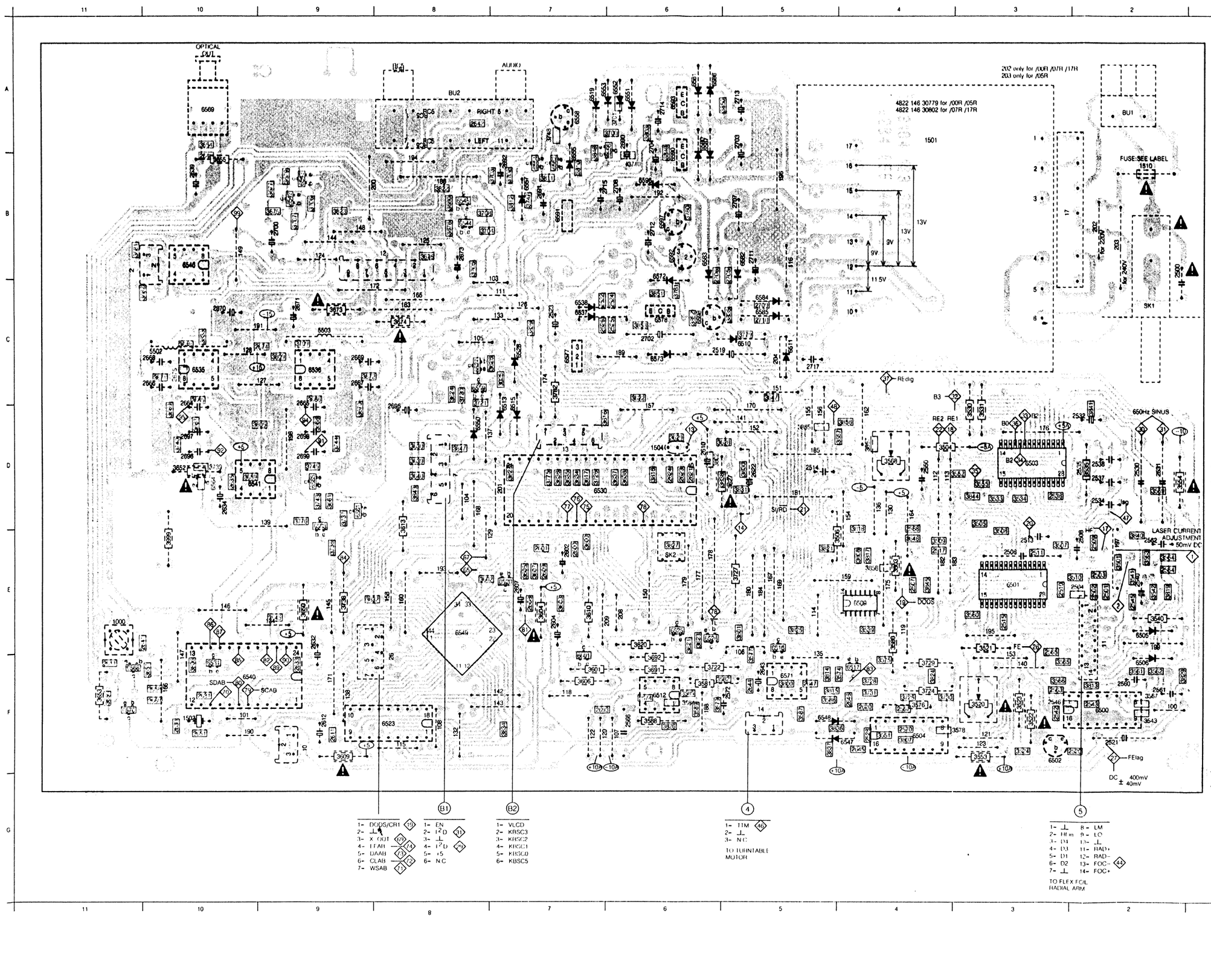
Supl 3



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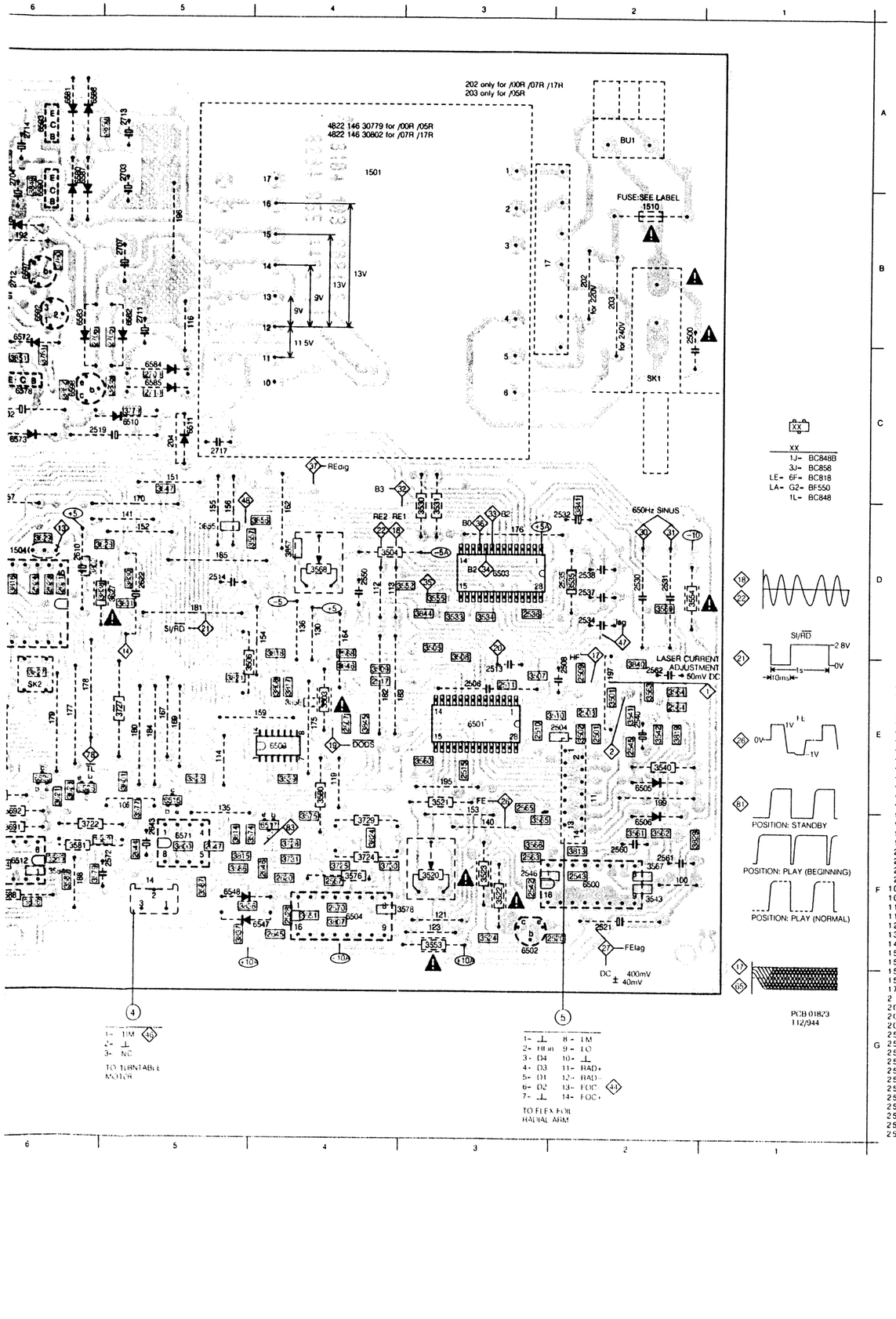

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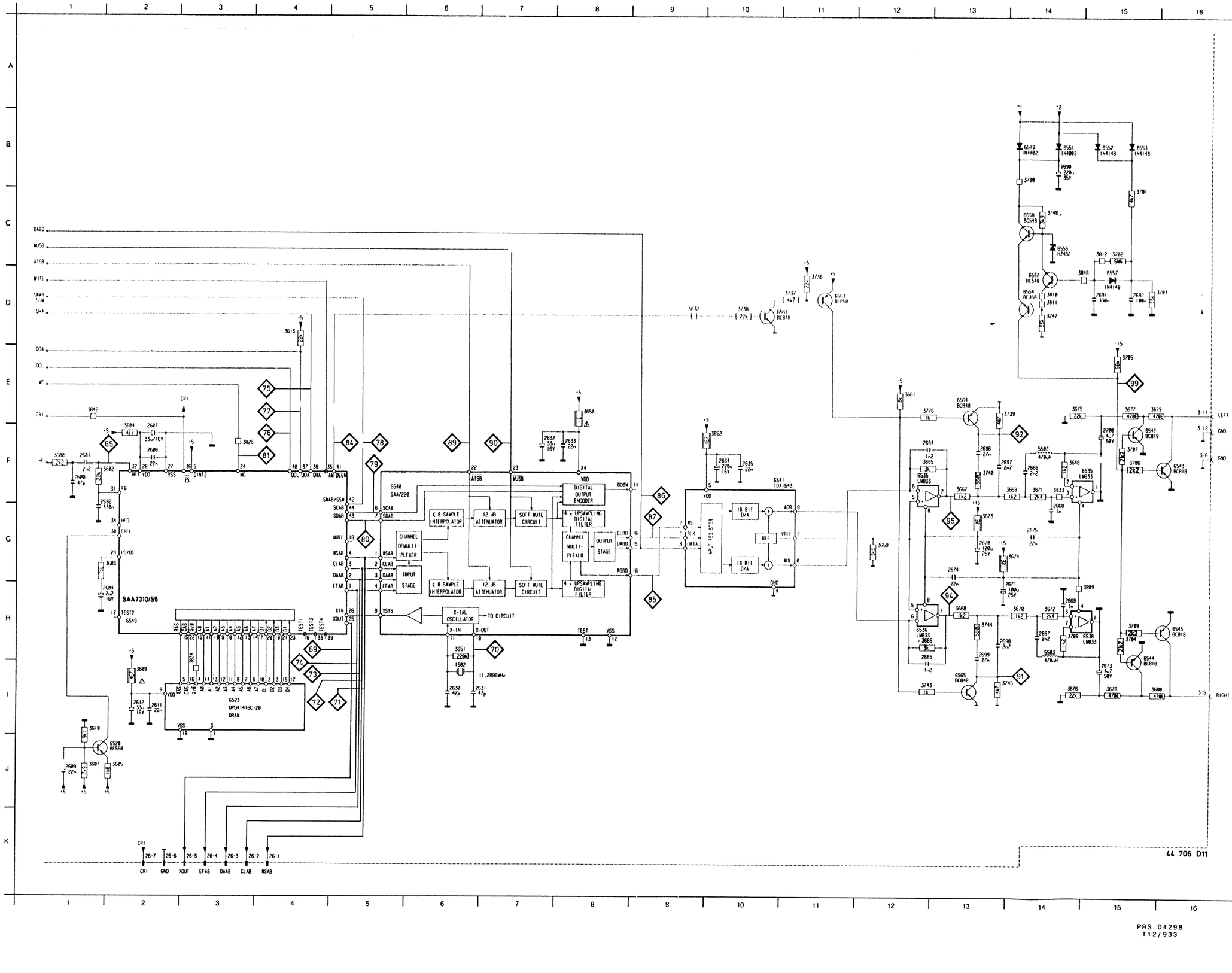
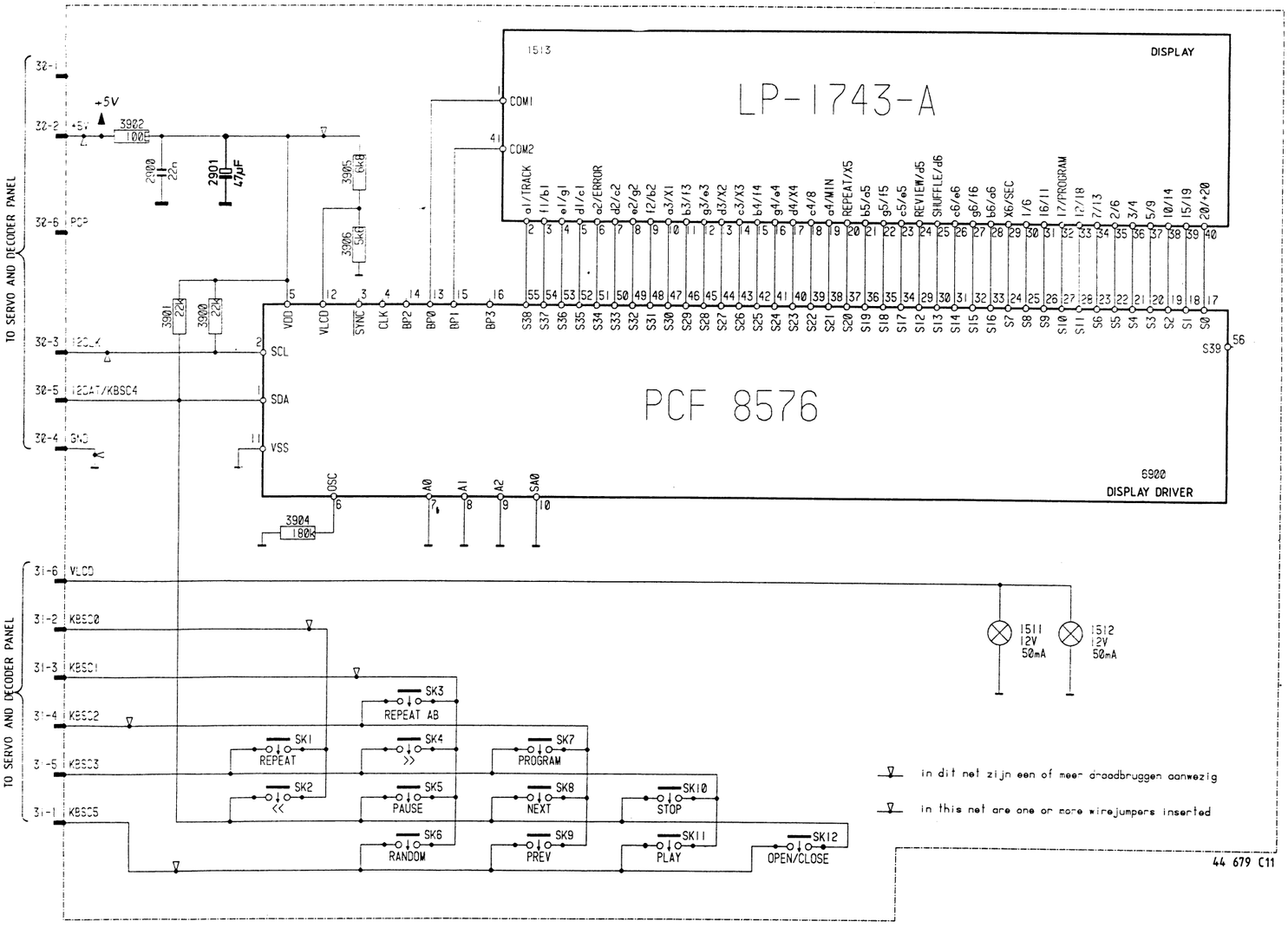
	179	E 6	2667	C 9	3647	C 5	3856	D 4		
	180	E 5	2668	C10	3648	C10	3857	D 4		
	181	D 5	2669	C 9	3650	E 9	3858	E 4		
	182	E 4	2670	C10	3651	F10	3999	E10		
	183	E 3	2671	C 9	3652	D10	5502	C10		
	184	E 5	2673	B 8	3653	F11	5503	C 9		
	185	D 5	2674	C 9	3654	A10	6500	F 2		
E	186	B 8	2675	C10	3655	B10	6501	E 3		
	188	F 6	2690	A 6	3656	F11	6502	F 3		
	189	C 6	2691	B 7	3657	F10	6503	D 3		
	190	F10	2692	B 7	3658	F10	6504	F 4		
	191	C10	2693	F 7	3659	D10	6505	E 2		
	192	B 6	2695	D 8	3660	F10	6506	F 2		
	193	E 8	2696	D10	3661	D 9	6509	E 4		
	194	B 8	2697	D10	3665	C10	6510	C 5		
	195	E 3	2698	D 9	3666	C 9	6511	C 5		
	196	B 5	2699	D 9	3667	D10	6512	F 6		
	197	E 2	2700	B 9	3668	D 9	6513	C 7		
	198	D 9	2702	C 6	3669	C10	6515	C 7		
	199	E 2	2703	A 5	3670	C 9	6516	E 5		
	200	B 9	2704	A 6	3671	C10	6517	F 4		
	201	D 7	2705	B 5	3672	C 9	6519	A 7		
	202	B 2	2706	B 6	3673	C 9	6520	E 7		
	203	B 2	2707	B 5	3674	C 8	6523	F 8		
F	10	F 9	2708	B 6	3675	B 9	6525	E 6		
	1000	E11	2709	C 5	3676	B 8	6526	E 6		
	11	E 2	2710	C 5	3677	B 9	6527	C 8		
	118	F 7	2711	B 5	3678	B 8	6528	C 7		
	12	B 8	2712	B 6	3679	B 9	6530	D 7		
	13	D 7	2713	A 5	3680	B 8	6531	F10		
	14	F 5	2714	A 6	3681	B11	6535	C10		
	1501	A 4	2715	B 7	3682	C10	6536	C 9		
	1502	F10	2717	C 5	3691	F 6	6537	C 7		
	1504	D 6	3025	C 7	3692	F 6	6538	C 7		
	1510	B 2	3501	E 2	3700	A 6	6540	F10		
	17	B 3	3502	E 2	3701	A 6	6541	D10		
	2	B11	3503	E 4	3702	B 7	6542	B 9		
	204	C 5	3504	D 4	3703	B 7	6543	B 9		
	208	E 6	3505	D 3	3704	B 8	6544	B 8		
	209	E 6	3506	E 5	3705	B 8	6545	B 8		
	2500	B 2	3507	E 3	3706	B 9	6546	B10		
G	2501	E 2	3508	E 3	3707	B 9	6547	F 4		
	2503	E 2	3509	E 4	3708	B 8	6548	F 5		
	2504	E 2	3510	E 2	3709	C 9	6549	E 8		
	2506	E 3	3520	F 3	3710	B 6	6550	D 8		
	2507	E 4	3521	E 3	3720	C 8	6551	A 6		
	2508	E 2	3522	F 3	3721	C 8	6552	A 6		
	2509	E 2	3523	F 3	3722	F 6	6553	A 7		
	2510	E 3	3524	F 3	3724	F 4	6554	B 7		
	2511	E 3	3530	D 3	3725	F 4	6555	A 7		
	2513	E 3	3531	D 3	3726	D 7	6556	A 6		
	2514	D 5	3533	D 3	3727	E 5	6557	B 7		

Sept 3

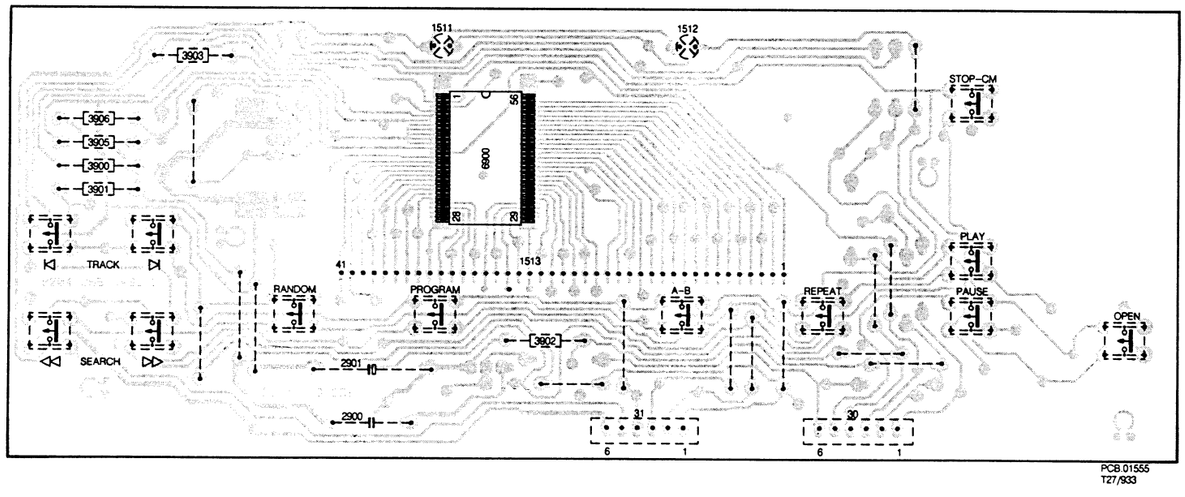


1502 I 6 6542 E15
2600 F 1 6543 F16
2601 F 1 6544 H15
2602 F 2 6545 H16
2604 H 2 6549 H 2
2607 E 2 6551 B14
2608 F 2 6552 B15
2609 J 1 6553 B15
2611 I 2 6554 D14
2612 I 2 6555 C14
2630 I 6 6557 C15
2631 I 7 6558 C14
2632 F 7 6561 D11
2633 F 8 6562 D14
2634 F10 6563 D11
2635 F10 6564 E13
2664 F12 6565 I 13
2665 H12
2666 F14
2667 H14
2668 F14
2669 H14
2670 G13
2671 G14
2673 H15
2674 G13
2675 G14
2690 B14
2691 D15
2692 D15
2696 F13
2697 F14
2698 H14
2699 H13
2700 E15
3600 F 1
3602 F 2
3603 G 2
3604 F 2
3605 J 2
3607 J 1
3609 I 2
3610 I 1
3613 D 4
3648 F14
3650 E 8
3651 H 6
3652 F10
3659 G12
3661 E12
3665 F12
3666 H12
3667 F13
3668 H13
3669 F14
3670 H14
3671 F14
3672 H14
3673 G13
3674 G14
3674 G14
3675 E14
3676 I 14
3677 E15
3678 I 15
3679 E15
3680 I 16
3700 B14
3701 B15
3702 C15
3703 D16
3704 H15
3705 E15
3706 F15
3707 F15
3708 H15
3709 H14
3736 D11
3737 D11
3738 D10
3739 E14
3740 F13
3743 I 12
3744 H13
3745 I 14
3747 D14
3748 C14
3776 E12
3809 H15
3810 D14
3811 D14
3812 C15
3824 E 1
3826 F 3
3832 D 9
3833 F14
3834 H 3
3848 C14
5502 F14
5503 H14
6519 B14
6520 J 2
6523 I 3
6535 F12
6535 F15
6536 H12
6536 H15
6540 F 5
6541 F10

CONTROL AND DISPLAY CIRCUIT



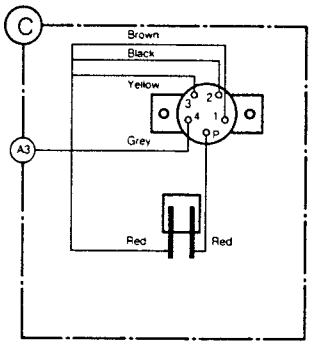
CONTROL AND DISPLAY PANEL

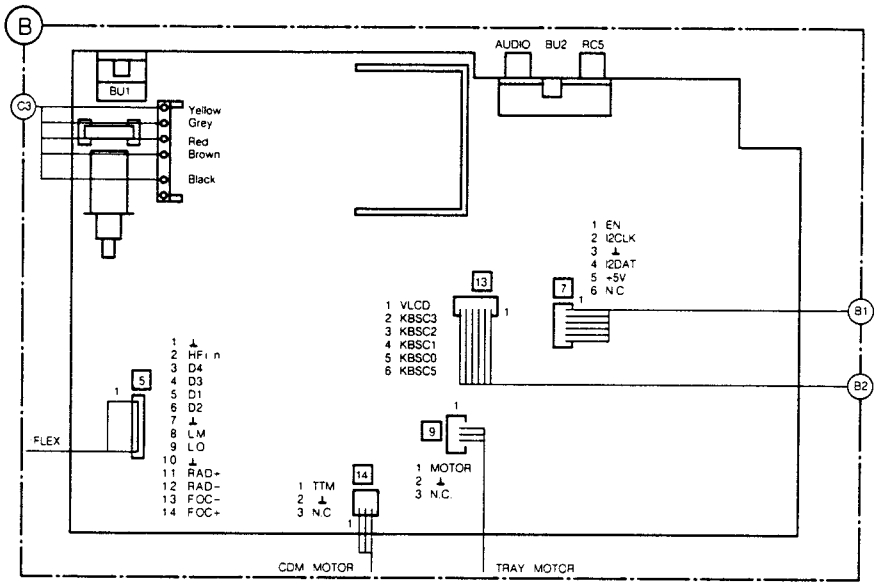


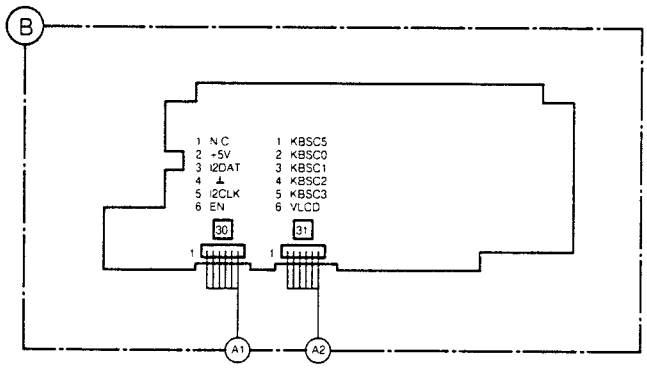
CONTROL & DISPLAY PARTS

ICPCF8576T	5322 209 11129
Tackt switch	4822 276 12465
Lamp 12V-50mA	4822 134 40944
Display	4822 130 90662
47µF 25V	4822 124 22027
22nF 16V	4822 122 10166
22K	4822 116 52463
100E	4822 116 52389
180K	4822 116 52502
6k8	4822 116 52441
5k6	4822 116 53027

WIRING DIAGRAM







VDA 02380
T02/945

ELECTRICAL PARTSLIST SERVO + DECODER PANEL

For non active chip components see separate list

MN4264-15	4822 209 70422
MC79L09AC	4822 209 73233
MC79M15CT	5322 209 86361
MC7905CT	4822 209 73233
TY40408 (+5V)	4822 209 71579
MC78M15	4822 209 80808
TDA8808T	4822 209 73234
TDA8809T/C2	4822 209 73235
SAA7310GP/S5	4822 209 61759
µPD41416C-20	4822 209 50582
SAA7220	4822 209 11157
TDA1543	4822 209 73236
LM833N	4822 209 83163
NJM4560D	4822 209 83274
TCA0372DP2	4822 209 72587
MC68HC05C8P	4822 209 61011

BC858	5322 130 41983
BC848C	5322 130 42136
BC848	4822 130 61207
BC328-16	4822 130 41023
BC328	4822 130 44104
BC338	4822 130 44121
BC558B	4822 130 44197
BC858 Ⓒ	5322 130 42012
BC848	5322 130 41981
BC818	4822 130 42675
BF550	4822 130 42131
BC548	4822 130 40938

Miscellaneous

Spring clip	4822 255 40179
Cinch socket	4822 267 40766
Switch (tray)	4822 276 12523
Mains switch	4822 276 11309
Mains inlet	4822 265 20291
Phone socket	4822 267 30743
Fuse holder	4822 256 30274
Mains transformer	4822 146 30701
Fuse T160mA	4822 253 30009
Voltage selector	4822 277 21366
Safety cover	4822 462 41505
Fuse carrier	4822 255 41023
Mains transformer/61R	4822 146 21489

3,3nF	400 V ⚠	4822 122 40327
3,3nF		4822 126 10005
22nF		4822 122 10166
1nF		4822 122 31746
220nF	63V	4822 121 42245
470nF	100V	4822 121 51252
8,2µF	63V	4822 121 51321
3,3nF	63V	5322 122 31848
4,7nF		4822 121 51314
1,2nF		4822 121 51309
330nF		5322 121 42661
4,7µF	50V	4822 124 41577
6,8µF	50V	4822 124 41578
33µF	16V	4822 124 40272
47µF	25V	4822 124 41527
100µF	25V	4822 124 41528
220µF	16V	4822 124 40196
220µF	35V	4822 124 41572
470µF	35V	4822 124 41573
4700µF	16V	4822 124 41458
1000µF	16V	4822 124 41571
6800µF	16V	4822 124 41591

Bipolair elco

0.68µF	16V	4822 124 41583
10µF	25V	4822 124 41558
100µF	16V	4822 124 22339

BZV85-C6V2	5322 130 32962
BZX55-C3V9	4822 130 31981
BZX55-C12	4822 130 34197
BZX79-B5V6	4822 130 34173
1N4002	5322 130 30684
1N4148	4822 130 30621
HZ7C2/7V2	4822 130 32862
BA314	4822 130 30879
HZ3B2	4822 130 32831
HZ7A3	4822 130 33523
BAT85	4822 130 31983

CSA4.000 mHz	4822 242 70831
11289.6 kHz	4822 242 71349

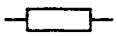
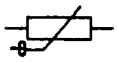
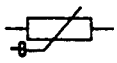
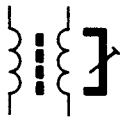
Coil 4.7 mH	4822 157 53141

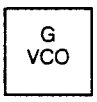
	1/3 Watt
4,7Ω	4822 116 52858
12Ω	4822 111 30511
18Ω	4822 111 31515
100Ω	4822 116 52389
120Ω	4822 116 52394
220Ω	4822 116 52407
330Ω	4822 116 52416
750Ω	4822 116 52432
1kΩ	4822 116 52391
1,2kΩ	4822 116 52395
1,8kΩ	4822 116 53109
2,2kΩ	4822 116 52408
4,7kΩ	4822 116 52426
5,6kΩ	4822 116 52438
6,8kΩ	4822 116 52925
10kΩ	4822 116 52452
22kΩ	4822 116 52463
47kΩ	4822 116 52472
100kΩ	4822 116 52973
180kΩ	4822 116 52505
5,6MΩ	4822 116 52533
680kΩ	4822 116 52536

Non flammable safety resistors ⚠

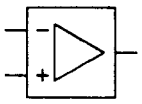
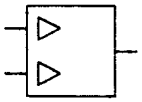
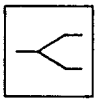
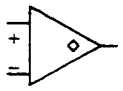
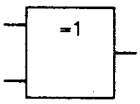
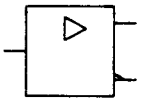
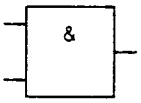
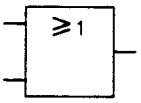
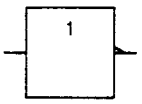
12Ω	4822 111 30511
1Ω	4822 111 30483
4,7Ω	4822 111 30499
10Ω	4822 111 30508
33Ω	4822 111 30522
1,8kΩ	4822 116 53109
18Ω	4822 111 30515

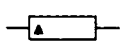
4,7kΩ	4822 101 10685
22kΩ	4822 100 20522

SYMBOL	DESCRIPTION
	Capacitor, general
	Electrolytic capacitor (+ and – may be omitted)
	Bipolar electrolytic capacitor (+ may be omitted)
	Resistor, general
	N.T.C. resistor
	P.T.C. resistor
	Voltage divider with preset adjustment
	Chip jumper
	Pin contact
	Bus contact
	Coil, self-induction
	Transformer with electrically poor conducting core and adjustable pre-magnetization
	Diode
	Zener diode
	Stabistor
	Double variable capacity diode (in one envelope)
	Photo conductive diode
	L.E.D.

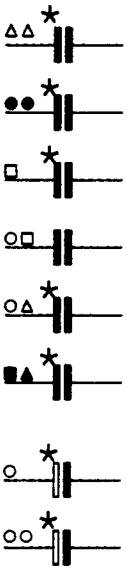
SYMBOL	DESCRIPTION
	Transistor (N.P.N.)
	Transistor (P.N.P.)
	Direct current (DC)
	Alternating current (AC)
	Earth (functional)
	Frame or chassis connection
	Direction in which AC voltages are passed on (optional present)
	Interrupted line
	Not-connected crossing lines
	Connected lines
	Cable tree with lead-outs
	Changer, general (arrow is optional)
	Voltage Controlled Oscillator
	Band-pass filter
	Phase changing network
	Delay element
	Amplifier, general

MDA.00083
T32-735

SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
	Exclusive OR gate
	True/complement amplifier with high input
	Flip Flop
	AND gate
	OR gate
	Inverter with high input



0.2W (CR 16)	≤ 220k	5%
	> 270k	10%
0.33W (CR 25)	≤ 1M	5%
	> 1M	10%
0.33W (SFR25)		5%
0.25W (VR 25)	≤ 10M	5%
	> 10M	10%
0.5W (CR 37)	≤ 1M	5%
	> 1M	10%
0.67W (CR 52)		5%
1.15W (CR 68)		5%



Ceramic plate

Polyester flat foil

Polyester mepolesco

Mylar
(Polyester flat foil small sized)

Micropoco

Tubular ceramic
(body colour pink or yellow/green)

Miniature single elco

Subminiature tantalum

* a=2,5V
b=4V
c=6,3V
d=10V
e=16V
f=25V
g=40V
h=63V
i=100V
j=125V
l=125V
m=150V
n=160V
q=200V
r=250V
s=300V
t=350V
u=400V
v=500V
w=630V
x=1000V
A=1,6V
B=6V
C=12V
D=15V
E=20V
F=35V
G=50V
H=75V
I=80V

MDA.00084
T32-735

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1 pF	5%	4822 122 32479
1,2 pF	5%	4822 122 33013
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
5,6 pF	5%	4822 122 32506
6,8 pF	5%	4822 122 32507
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
15 pF	5%	4822 122 32504
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 31961
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
1,8 nF	10%	4822 122 32153
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947
180 nF	10%	4822 122 32915
220 nF	20%	4822 122 32715

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0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90388
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392

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4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394
6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90105
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545

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6,8 k	2%	4822 111 90544
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428
10M	5%	5322 111 91141

CHANGES

Changed pages
Introductions with A89-119

Page	Reason
Frontpage	/60R/65R and /70R added
2-1-a	Max. diameter added
2-3-a	Partslist adapted for /60R, /65R and /70R
4-2-a	Drawing corrected
	Table adapted for /60R, /65R and /70R
4-3-a	Mapping added
4-6-a	Mapping added
5-1-a	Circuit diagram corrected
	Correct printed circuit board given

CHANGES

Changed pages
Introductions with A89-121

Page	Reason
Frontpage	/61R added
2-3b	Partslist adapted
4-1-1	Wiring diagram added
4-4a	Due to change of main panel
4-5a	Due to change of main panel
4-5-1	Due to change of main panel
4-5-2	Due to change of main panel
4-6b	Schematic diagram adapted
5-2a	Partslist adapted